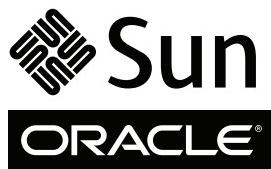
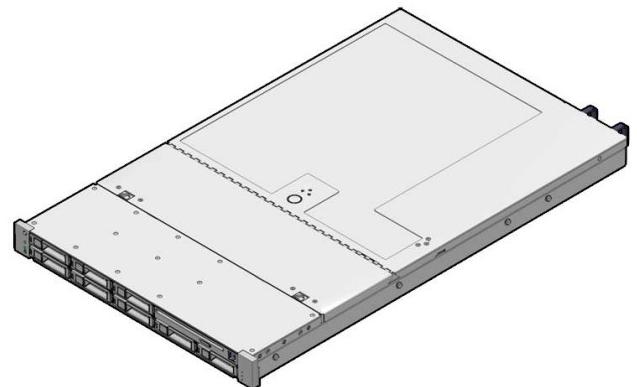


# Sun Fire™ X4140 Server Service Manual

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Part No. 820-2401-14  
September 2010, Revision A

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# Preface

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The *Sun Fire X4140 Server Service Manual* provides detailed procedures for removing and replacing replaceable parts in the Sun Fire™ X4140 Server. This manual also includes information about the use and maintenance of the server.

This document is written for technicians, system administrators, authorized service providers (ASPs), and users who have advanced experience troubleshooting and replacing hardware.

---

## How This Document Is Organized

This manual contains the following chapters.

**TABLE P-1** Sun Fire X4140 Server Service Manual Chapters

Chapter	Describes:
Chapter 1	<a href="#">Sun Fire X4140 Server Overview</a> provides an overview of the system, including front and rear panel features. Contains illustrations showing system components.
Chapter 2	<a href="#">Preparing to Service the System</a> describes the steps necessary to prepare the system for service.
Chapter 3	<a href="#">Servicing Customer-Replaceable Devices</a> describes the service procedures that can be done while the system is running (hot serviceable procedures).
Chapter 4	<a href="#">Servicing Motherboard Components</a> describes the service procedures for the motherboard and its associated components, including installing and upgrading memory modules (DDR2 DIMMs).
Chapter 5	<a href="#">Servicing Infrastructure Boards and Components</a> describes the service procedures for all other components.

**TABLE P-1** Sun Fire X4140 Server Service Manual Chapters (*Continued*)

Chapter	Describes:
Chapter 6	<a href="#">Returning the Server to Operation</a> describes how to bring the server back to operation after performing service procedures.
Appendix A	<a href="#">Connector Pinouts</a> contains pinout tables for all external connectors.
Appendix B	<a href="#">BIOS Power-On Self-Test (POST) Codes</a> contains information on how the BIOS POST works, how to redirect output, and how to change options.
Appendix C	<a href="#">BIOS Screens</a> contains examples of typical BIOS screens.

## Related Documentation

To view the latest Sun Fire X4140 server documentation online, go to <http://docs.sun.com>, and then navigate to Sun Fire X4140 server documentation.

The following table lists the available documents related to service.

**TABLE P-2** Sun Fire X4140 Server Related Documentation

Title	Description	Part Number
<i>Where to Find Sun Fire X4140, X4240, and X4440 Servers Documentation</i>	Where to find the documentation for the Sun Fire X4140, X4240, and X4440 servers.	820-2395
<i>Sun Fire X4140, X4240, and X4440 Server Installation Guide</i>	How to install the Sun Fire X4140, X4240, and X4440 server in an equipment rack, how to configure the service processor, and how to configure the preinstalled Solaris™ Operating System.	820-2394
<i>Sun Fire X4140, X4240, and X4440 Servers Operating System Installation Guide</i>	How to install and configure operating systems on the Sun Fire X4140, X4240, and X4440 servers. Excludes the preinstalled Solaris Operating System and the Windows operating system.	820-2397
<i>Sun Fire X4140, X4240, and X4440 Server Windows Operating System Installation Guide</i>	How to install the Windows operating system on the Sun Fire X4140, X4240, and X4440 servers.	820-2399
<i>Sun Fire X4140, X4240, and X4440 Server Diagnostics Guide</i>	How to troubleshoot the Sun Fire X4140, X4240, and X4440 server. Includes information on system event logs.	820-3067

**TABLE P-2** Sun Fire X4140 Server Related Documentation

Title	Description	Part Number
<i>Sun Integrated Lights Out Manager 2.0 User's Guide</i>	Describes the Integrated Lights Out Manager, which is system management software that runs on the Sun Fire X4140, X4240, and X4440 server service processor.	820-1188
<i>Sun Fire X4140, X4240, and X4440 Servers Product Notes</i>	Information about late-breaking changes and problems in the Sun Fire X4140, X4240, and X4440 servers.	820-2396
<i>x64 Servers Utilities Reference Manual</i>	Contains instructions for using applications and utilities common to many X64 servers.	820-1120

## Before You Read This Document

To fully use the information in this document, you must have thorough knowledge of the topics discussed in the *Sun Fire X4140 Server Product Notes*.

---

## Sun Online

The following table shows where to find Sun documents online.

**TABLE P-3** Sun Fire X4140 Server Online Documents

Sun Function	URL	Description
Sun Documentation	<a href="http://docs.sun.com">http://docs.sun.com</a>	You can navigate to the Sun Fire X4140 server document page and then download PDF and view HTML documents. Includes the LSI card <i>MegaRAID Storage Manager x64 Server Utilities Reference Manual</i> for MSM.
Support	<a href="http://www.sun.com/support/">http://www.sun.com/support/</a>	Obtain technical support and download patches.
Training	<a href="http://www.sun.com/training/">http://www.sun.com/training/</a>	Learn about Sun courses.
Warranty	<a href="http://www.sun.com/service/support/warranty/index.html">http://www.sun.com/service/support/warranty/index.html</a>	Obtain specific details regarding your warranty.
Feedback	<a href="http://www.sun.com/hwdocs/feedback/">http://www.sun.com/hwdocs/feedback/</a>	Submit your comments.

# Safety Symbols

Note the meanings of the following symbols that might appear in this document.



**Caution** – There is a risk of personal injury or equipment damage. To avoid personal injury and equipment damage, follow the instructions.



**Caution** – Hot surface. Avoid contact. Surfaces are hot and might cause personal injury if touched.



**Caution** – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

## Sun Welcomes Your Comments

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Please include the title and part number of your document with your feedback:

Example: *Sun Fire X4140 Server Service Manual*, part number 820-2401-14.

# Sun Fire X4140 Server Overview

---

This chapter provides an overview of the features of the Sun Fire X4140 Server.

The following information is included:

- [Section 1.1, “Product Description” on page 1-1](#)
  - [Section 1.2, “Sun Fire X4140 Server Chassis Overview” on page 1-3](#)
  - [Section 1.3, “Sun Fire X4140 Server Front Panel Features” on page 1-8](#)
  - [Section 1.4, “Sun Fire X4140 Server Rear Panel Features” on page 1-9](#)
  - [Section 1.5, “Illustrated Parts Breakdown” on page 1-10](#)
- 

## 1.1 Product Description

The Sun Fire X4140 Server is an enterprise-class two-socket rackmount x64 system powered by the AMD Opteron processor, packing high performance room and for growth with three PCIe slots and 16 DIMM slots into a compact 1-RU footprint.

The product features are listed in [TABLE 1-1](#).

**TABLE 1-1** Sun Fire X4140 Server System Features

Feature	Description (Sun Fire X4140 Server)
Processor	AMD64 Opteron Socket F [1207] (1MByte L2 cache per processor chip) – dual core capable. Supports Single, Dual, and Quad core.
Memory	16 DDR-2 DIMM slots. 8 DDR-2 DIMM slots per socket. Up to 800 MHZ memory speeds depending upon processor type and memory configuration. PC2-4200R 533 MHz Registered DIMMs with ECC PC2-5300R 667 MHz Registered DIMMs with ECC PC2-6400R 800 MHz Registered DIMMs with ECC 1 GB, 2 GB, 4 GB, or 8 GB per DIMM See <a href="#">Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3</a> .
Ethernet ports	4 ports, 10/100/1000 Mbps, auto-negotiating through two separate controllers.
Internal drives	SAS (up to 8) or SATA (up to 4) SSDs. Up to 8 SFF SAS 73-GB or 146-GB 2.5-inch form factor drives. Support for hardware-integrated RAID 0 (striping) and RAID 1 (mirroring). Optional RAID Levels 0, 1, IE, 5, 5EE, 6, 10, 50, 60 with SAS drives.
Removable media	1 slimline DVD drive, supporting CD-R/W, CD+R/W, DVD-R/W, DVD+R/W.
USB ports	5 USB 2.0 ports: 2 in front, 2 in rear, plus 1 internal USB port.
Service ports	1 RJ-45 serial management port (SER MGT) (default connection to access service processor). 1 10-MB network management port (NET MGT) (to access service processor). HD-15 VGA video port.
Cooling	7 hot-swappable system fan modules (2 fans per module). An air baffle facilitates processor/memory airflow.
PCI interfaces	3 standard low profile PCIe slots on three riser boards (x8 and x16 electrical/x16 mechanical).
Power	AC power: 100–120/200–240 V AC, 12/6 A, 50–60 Hz. 1 or 2 hot-swappable 650W power supply units (PSUs) to provide N+N redundancy, with energy efficient design.

**TABLE 1-1** Sun Fire X4140 Server System Features (*Continued*)

Feature	Description (Sun Fire X4140 Server)
Remote management	On-board Integrated LOM service processor providing: <ul style="list-style-type: none"><li>• DMTF CLP-based Command Line Interface (CLI) over SSH</li><li>• Web-based browser interface GUI over HTTPS</li><li>• IPMI 2.0</li><li>• SNMP (v1, v2c, and v3)</li><li>• Remote graphical access (remote KVM) over Ethernet</li><li>• Remote storage over Ethernet</li></ul>
Operating system	Solaris 10, Update 4. Solaris 10 OS with specific Sun Fire X4140 Server software components. Supports: <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux 4.7 (AS) (32-bit/64-bit)</li><li>• Red Hat Enterprise Linux 5.3 (64-bit)</li><li>• SUSE Linux Enterprise Server 10 SP2 (64-bit)</li><li>• VMware ESX 3.0.3</li><li>• VMware ESXi 3.5 and ESXi3.5</li><li>• Windows Server 2003 x32 SP2 or greater (Standard Edition/ Enterprise Edition)</li><li>• Windows 2008 DataCenter</li></ul>
Other software	Java™ Enterprise System with a 90-day trial license.

Refer to the Sun Fire X4140, X4240, and X4440 Servers Product Notes for additional items.

---

## 1.2 Sun Fire X4140 Server Chassis Overview

The Sun Fire X4140 Server is based on an all-new chassis family.

## 1.2.1 Infrastructure Boards

The Sun Fire X4140 Server infrastructure boards are listed in [TABLE 1-2](#).

**TABLE 1-2** Infrastructure Boards

Board	Description	Reference
<b>Motherboard FRU</b>	<p>The motherboard includes processor modules, slots for 16 DIMMs, memory control subsystems, and the service processor (Integrated LOM) subsystem.</p> <p>The server motherboard provides an integrated lights out management (ILOM) service processor function, which includes remote boot and remote software upgrades. The service processor (ILOM) subsystem controls the host power and monitors host system events (power and environmental). The SP ILOM controller draws power from the host's 3.3V standby supply rail, which is available whenever the system is receiving AC input power, even when the system is turned off.</p>	<a href="#">Section 4.6, "Servicing the Motherboard Assembly" on page 4-21</a> <a href="#">Refer to the Sun Fire 4140, 4240 and 4440 Server Diagnostics Guide for ILOM sensor information.</a> <a href="#">Refer to the <i>Sun Integrated Lights Out Manager User's Guide</i></a>
<b>Power distribution board FRU</b>	<p>This board distributes main 12V power from the power supplies to the rest of the system. It is directly connected to the paddle card, and to the motherboard via a bus bar and ribbon cable. It also supports a top cover interlock ("kill") switch.</p> <p>In the Sun Fire X4140 Server, the power supplies connect directly to the power distribution board.</p>	<a href="#">Section 5.6, "Servicing the Power Distribution Board (PDB)" on page 5-15</a>
<b>Paddle card FRU</b>	<p>This board serves as the interconnect between the power distribution board and the fan power boards, Drives backplane, and I/O board.</p>	<a href="#">Section 5.7, "Servicing the Paddle Card" on page 5-17</a>
<b>Fan power boards (2) FRU</b>	<p>These boards carry power to the system fan modules. In addition, they contain fan module status LEDs, and they transfer I<sup>2</sup>C data for the fan modules.</p>	<a href="#">Section 5.2, "Servicing the Fan Power Boards" on page 5-4</a>
<b>Drives backplane FRU</b>	<p>This board includes the connectors for the drives, as well as the interconnect for the I/O board, Power and Locator buttons, and system/component status LEDs. The Sun Fire X4140 Server has an eight-disk backplane. Each drive has an LED for power/activity, fault, and ok-to-remove.</p>	<a href="#">Section 5.4, "Servicing the Drives Backplane" on page 5-11</a>
<b>Front I/O board FRU</b>	<p>This board carries the front panel USB connections from the drives backplane. The board connects directly to the drives backplane. It is packaged with the DVD drive as a single unit.</p>	<a href="#">Section 5.1, "Servicing the DVD/USB Module" on page 5-2</a>
<b>PCIe risers FRU</b>	<p>In the Sun Fire X4140 Server, each riser supports two PCIe cards. There are three risers per system, each attached to the rear of the motherboard.</p>	<a href="#">Section 4.3, "Servicing PCIe Risers" on page 4-13</a>

## 1.2.2 Dimensions

The 1U chassis form factor dimensions are listed in [TABLE 1-3](#).

**TABLE 1-3** Sun Fire X4140 Server Dimensions

Dimension	Sun Fire X4140 Server
Height	44 mm/1.73 inches
Width	425.5 mm/16.75 inches
Depth	711.2 mm/28.0 inches
Weight	Minimum: 13.9 kg/30.6 lbs. Maximum: 18.4 kg/40.6 lbs.

## 1.2.3 System Cables

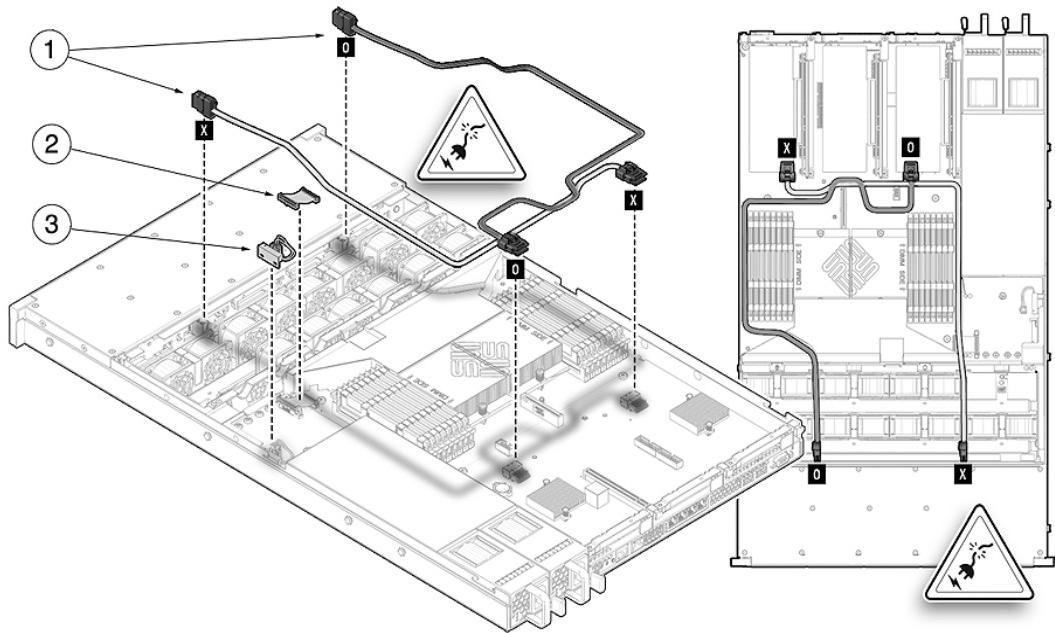
The Sun Fire X4140 Server internal cables are listed in [TABLE 1-4](#).

**TABLE 1-4** Sun Fire X4140 Server Cables

Cable	Connects...
Top cover interlock	To the power distribution board
Ribbon cable	Between the power distribution board and the motherboard
Drives data cables (2)	Between the motherboard (or optional HBA PCI-Express Card) and the drives backplane

[FIGURE 1-1](#) and [FIGURE 1-2](#) show the Sun Fire X4140 Server internal cables.

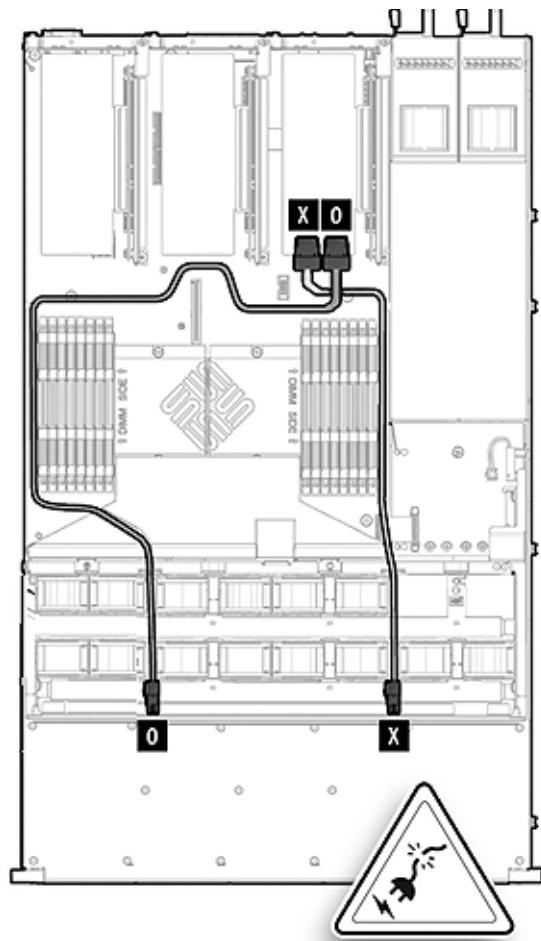
**FIGURE 1-1** Cables for Sun Fire X4140 Server With SATA On-board System Controller



**Figure Legend**

- 
- 1** SATA Drives Data Cable
  - 2** Motherboard to Power Distribution Board Cable
  - 3** Top Cover Interlock
-

**FIGURE 1-2** Cables for Sun Fire X4140 Server With SAS



---

**Caution** – The Drives Data Cable (X) and (O) connectors must be placed in the order shown.

---

# 1.3 Sun Fire X4140 Server Front Panel Features

FIGURE 1-3 shows front panel features on the Sun Fire X4140 Server.

FIGURE 1-3 Front Panel Features

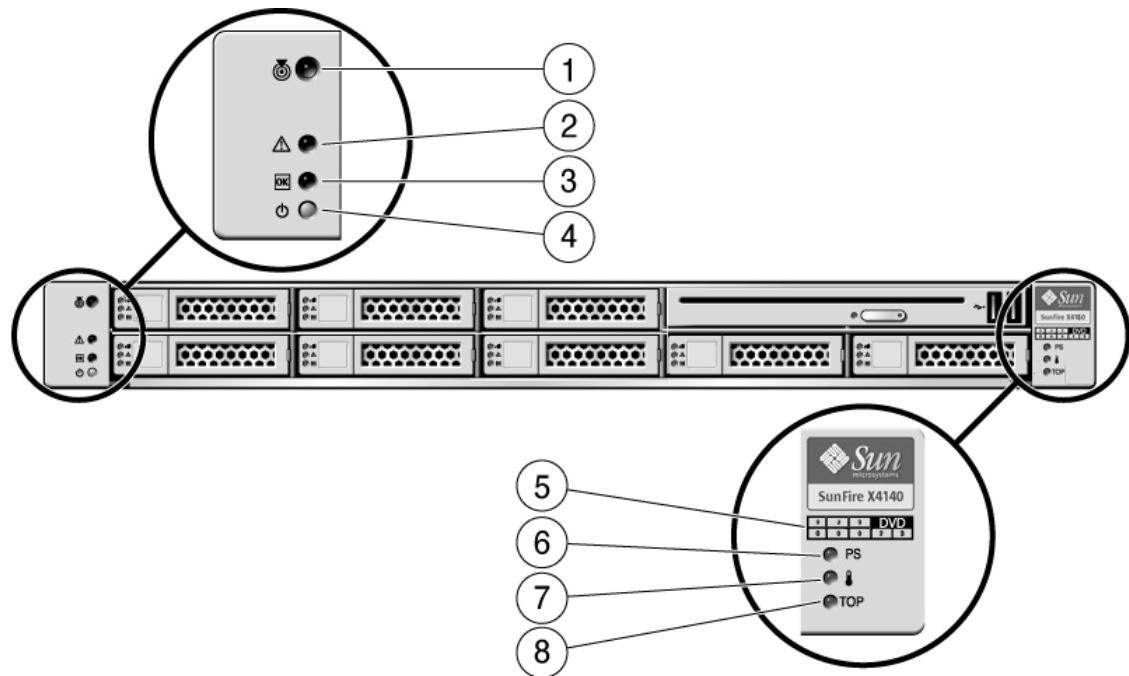


Figure Legend

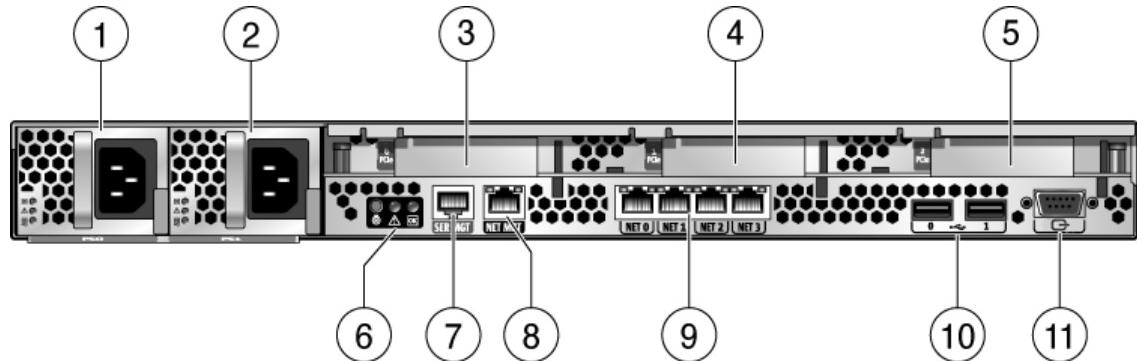
- |   |                                     |   |   |
|---|-------------------------------------|---|---|
| 1 | Locator LED/Locator button (white)  | 5 | Drive map                                 |
| 2 | Service Action Required LED (amber) | 6 | Power Supply Service Required LED (amber) |
| 3 | Power/OK LED (green)                | 7 | System Overtemperature LED (amber)        |
| 4 | Power button                        | 8 | Fan Module Service Required LED (amber)   |

## 1.4 Sun Fire X4140 Server Rear Panel Features

FIGURE 1-4 shows rear panel features on the Sun Fire X4140 Server. For more detailed information about ports and their uses, see the *Sun Fire X4150 Server Installation Guide*.

For a detailed description of PCIe slots, see [Section 4.4.1, “Sun Fire X4140 Server PCIe Card Guidelines” on page 4-16](#).

**FIGURE 1-4** Rear Panel Features



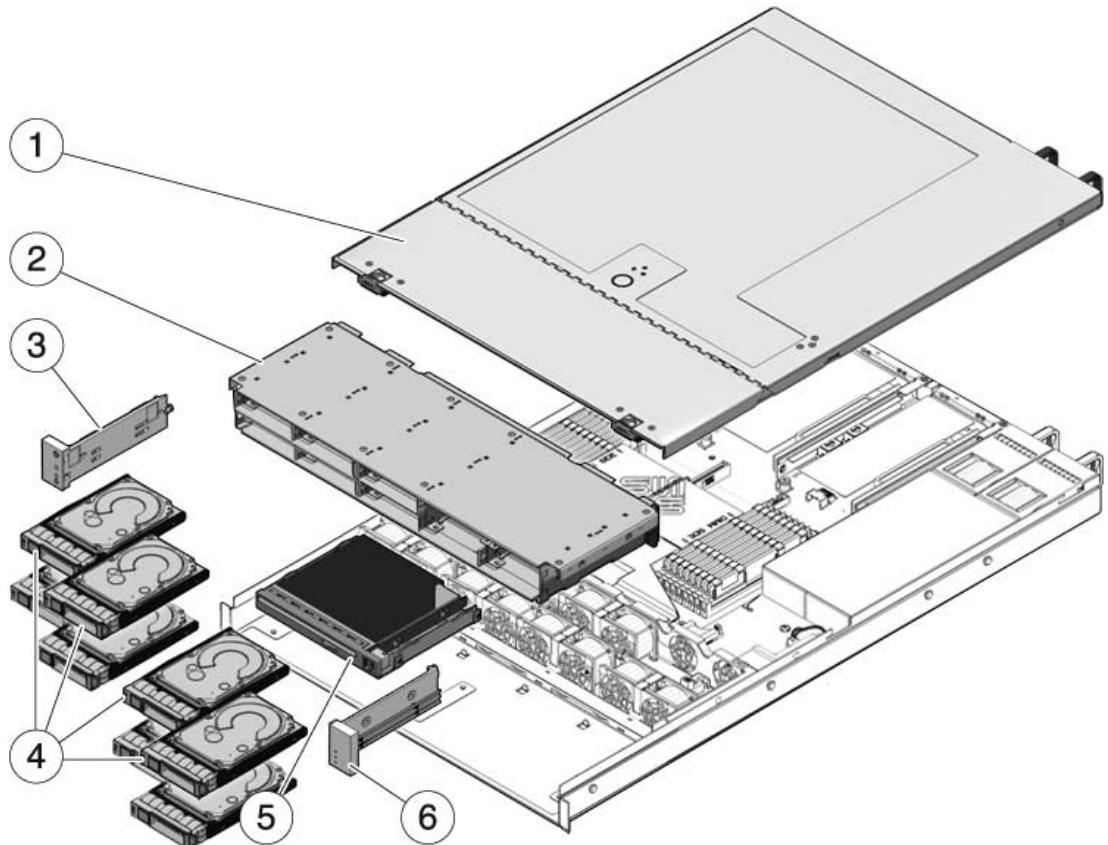
**Figure Legend**

1	PSU 0	7	Serial Management Port
2	PSU 1	8	Network Management Port
3	PCIe 0	9	Gbit Ethernet Ports (0, 1, 2, 3)
4	PCIe 1	10	USB Ports (0, 1)
5	PCIe 2	11	HD-15 Video Port
6	Rear Panel System Status LEDs - Locator LED/Locator button (white) - Locator LED/Locator button (white) - Power/OK LED (green)		

## 1.5 Illustrated Parts Breakdown

**FIGURE 1-5** shows the I/O components, and **FIGURE 1-6** shows the power distribution and fan module components. Use these illustrations, and the accompanying tables, to identify parts in your system.

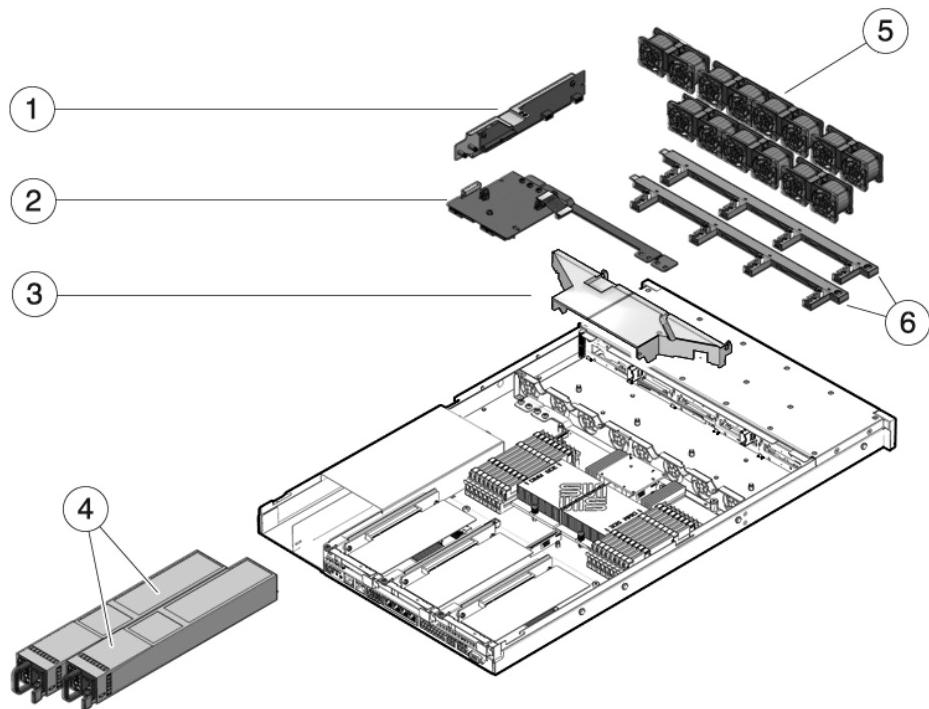
**FIGURE 1-5** Sun Fire X4140 Server I/O Components



**Figure Legend**

1	Top Cover	4	Hard Drives or Solid-State Drives
2	Disk Cage	5	DVD/USB Module
3	Left Control Panel Light Pipe Assembly	6	Right Control Panel Light Pipe Assembly

**FIGURE 1-6** Power Distribution and Fan Module Components



**Figure Legend**

---

1	Paddle Card	4	Power Supplies
2	Power Distribution Board/Bus Bar Assembly	5	Fan Modules
3	Air Baffle	6	Fan Boards

---



# Preparing to Service the System

---

This chapter describes how to prepare the Sun Fire X4140 Server for servicing.

The following topics are covered:

- [Section 2.1, “Safety Information” on page 2-1](#)
  - [Section 2.2, “Required Tools” on page 2-2](#)
  - [Section 2.3, “Obtaining the Chassis Serial Number” on page 2-2](#)
  - [Section 2.4, “Powering Off the Server” on page 2-4](#)
  - [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#)
  - [Section 2.6, “Removing a Server From the Rack” on page 2-7](#)
  - [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#)
  - [Section 2.8, “Removing the Top Cover” on page 2-11](#)
- 

## 2.1

## Safety Information

This section describes important safety information that you need to know prior to removing or installing parts in the Sun Fire X4140 Server.



**Caution** – Never attempt to run the server with the covers removed. Hazardous voltage present.

---



**Caution** – The covers must be in place for proper air flow. Equipment damage possible.

---

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all Sun cautions, warnings, and instructions marked on the equipment and described in *Important Safety Information for Sun Hardware Systems* (816-7190).
  - Follow all cautions, warnings, and instructions marked on the equipment and described in the *Sun Fire X4140 Server Safety and Compliance Guide*.
  - Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
  - Follow the electrostatic discharge safety practices as described in this chapter.
- 

## 2.2 Required Tools

The Sun Fire X4140 Server can be serviced with the following tools:

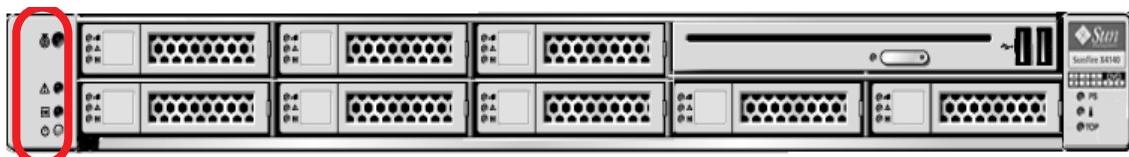
- Antistatic wrist strap
  - Antistatic mat
  - No. 2 Phillips screwdriver
  - No. 3 Phillips screwdriver
  - No. 1 flat-blade screwdriver (for battery removal)
  - Stylus or pencil (to power on server)
- 

## 2.3 Obtaining the Chassis Serial Number

To obtain support for your server, you need your chassis serial number. The chassis serial number is located on a label on the front of the server, and another label on the top of the server.

The chassis serial number can be obtained by using IPMItool. See *Sun Server CLI Tools and IPMItool User's Guide* (821-0997).

**FIGURE 2-1** Chassis Serial Number Label



## ▼ To View Chassis Serial Number

To view information about a system component, you need the Read Only (o) role enabled.

1. **Log in to the ILOM CLI.**

2. **At the prompt, type:**

```
-> cd /SYS  
/SYS  
-> cd MB  
/SYS/MB  
-> show chassis_serial_number type  
/SYS/MB  
Properties:  
chassis_serial_number = 0811QAD01C  
type = Motherboard
```

For more information, see *Sun Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide* (820-6412).

---

## 2.4 Powering Off the Server

To remove main power from the server, use one of the methods shown in the following table.

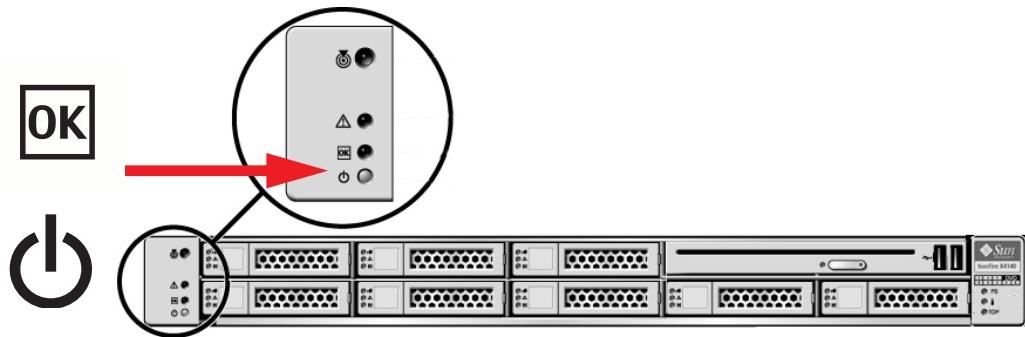
**TABLE 2-1** Shutdown Procedures

Shutdown	Method
<b>Graceful shutdown</b>	Use a pen, or other pointed object, to press and release the Power button on the front panel. Pressing the power button causes Advanced Configuration and Power Interface (ACPI)-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately.
<b>Emergency shutdown</b>	Press and hold the Power button for at least four seconds until the main power is off and the server enters standby power mode. See <a href="#">FIGURE 2-2</a> . When the main power is off, the Power/OK LED on the front panel flashes, indicating that the server is in standby power mode. <b>Caution</b> - All applications and files will be closed abruptly without saving changes. File system corruption might occur.
<b>ILOM SP CLI shutdown</b>	See <a href="#">Section 2.4.1, “Powering Off the Server Using the Service Processor Command Line” on page 2-5</a> .



**Caution** – To completely power off the server, you must disconnect the AC power cords from the rear panel of the server.

**FIGURE 2-2** Front Panel Power/OK LED



## 2.4.1 Powering Off the Server Using the Service Processor Command Line

You can use the service processor to perform a graceful shutdown of the server and ensure that all of your data is saved and the server is ready for restart.

Refer to the Solaris™ operating system documentation for additional information.

1. **Log in as a superuser or equivalent.**

Depending on the type of problem, you might want to view server status or log files, or run diagnostics before you shut down the server.

2. **Notify affected users.**

3. **Save any open files and quit all running programs.**

Refer to your application documentation for specific information.

4. **Shut down all logical domains.**

5. **Shut down the Solaris operating system.**

6. **Open an SSH session.**

7. **Log into the Service Processor.**

8. **Type:**

```
stop /SYS
```

## 2.5 Extending the Server to the Maintenance Position

The following components can be serviced with the server in the maintenance position:

- Hard drives
- SSDs
- Fan modules
- Power supplies
- DVD/USB module
- Fan power boards
- DDR2 DIMMs
- PCIe cards
- Motherboard battery

If the server is installed in a rack with extendable slide rails, use this procedure to extend the server to the maintenance position.

1. **(Optional) Issue the following command from the -> prompt to locate the system that requires maintenance.**

```
-> set /SYS/LOCATE value=fast_blink  
Locator indicator is on.
```

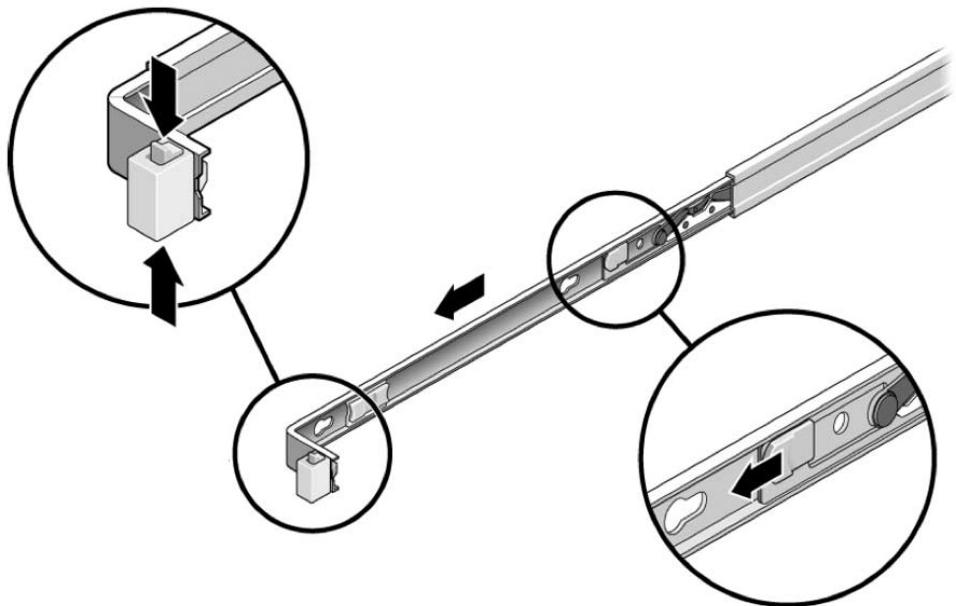
After you have located the server, press the Locator LED/Locator button to turn it off.

2. **Verify that no cables will be damaged or will interfere when the server is extended.**

Although the cable management arm (CMA) that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.

3. **Extend the lower floor arm on the cabinet for safety, if present.**
4. **From the front of the server, release the two slide release latches (FIGURE 2-3).**  
Squeeze the green slide release latches to release the slide rails.

**FIGURE 2-3** Slide Release Latches



5. While squeezing the slide release latches, slowly pull the server forward until the slide rails latch.
- 

## 2.6

## Removing a Server From the Rack

The server must be removed from the rack to service the following components:

- Motherboard
- Power distribution board
- Paddle card
- Disk cage
- Drives backplane
- Front panel light-pipe assemblies



---

**Caution –** If necessary, use two people to dismount and carry the chassis.

---

To remove a server from the rack:

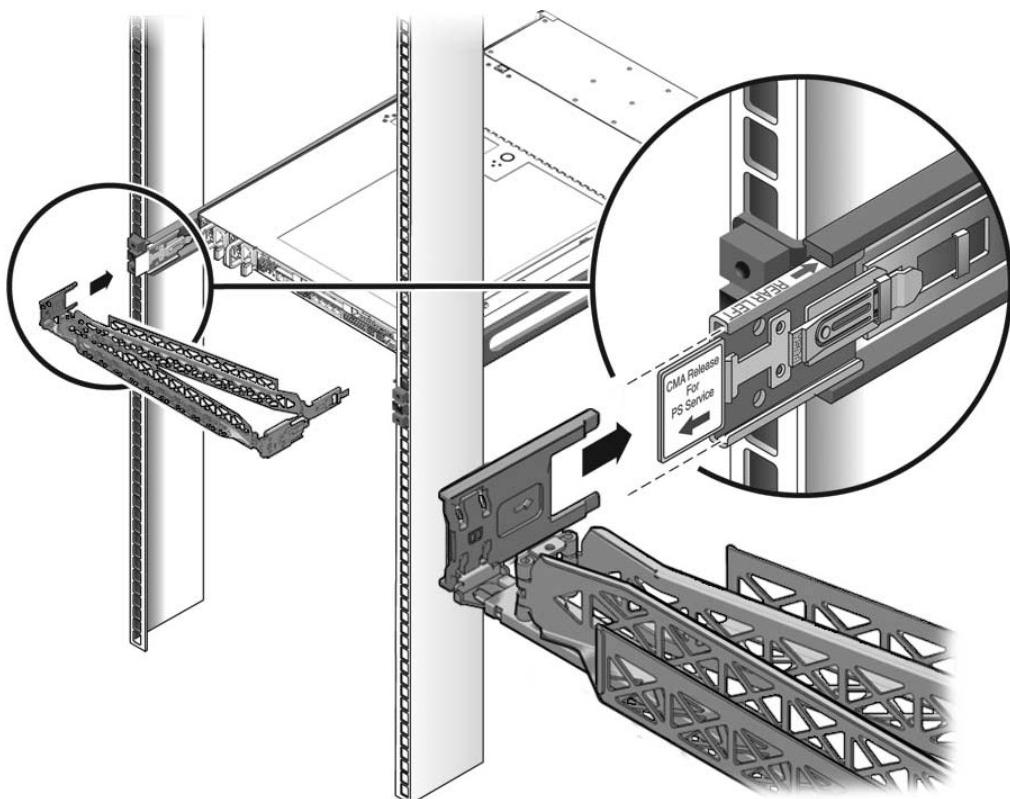
1. Disconnect all cables and power cords from the server.
2. Extend the lower floor arm on the cabinet for safety, if present.
3. Extend the server to the maintenance position.

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

4. Press the metal lever that is located on the inner side of the rail to disconnect the cable management arm (CMA) from the rail assembly ([FIGURE 2-4](#)).

The CMA is still attached to the cabinet, but the server chassis is now disconnected from the CMA.

**FIGURE 2-4** Metal Lever and Cable Management Arm

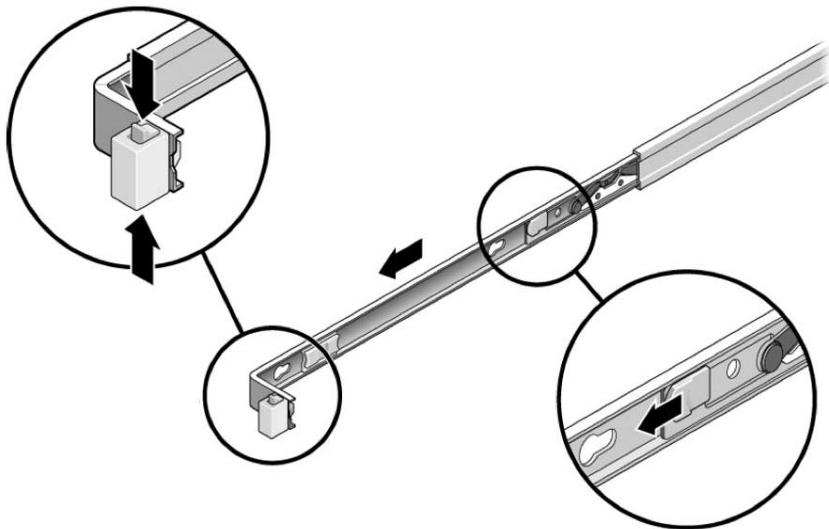


**Caution** – If necessary, use two people to dismount and carry the chassis.

5. From the front of the server, pull the release tabs forward and pull the server forward until it is free of the rack rails ([FIGURE 2-5](#)).

A release tab is located on each rail.

**FIGURE 2-5** Release Tabs and Slide Assembly



6. Set the server on a sturdy work surface.

---

## 2.7

# Performing Electrostatic Discharge and Antistatic Prevention Measures

### 2.7.1

## Electrostatic Discharge Safety Measures

Electrostatic discharge (ESD) sensitive devices, such as the motherboards, PCI cards, hard drives, SSDs, and memory cards, require special handling.



**Caution** – You must disconnect both power supplies before servicing any of the components documented in this chapter.



---

**Caution** – Circuit boards, hard drives, and SSDs contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy the components located on these boards. Do not touch the components without ESD precautions, especially along the connector edges.

---

### 2.7.1.1

#### Using an Antistatic Wrist Strap

Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, circuit boards, or PCI cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

---

**Note** – An antistatic wrist strap is not included in the accessory kit for the Sun Fire X4140 Server. However, antistatic wrist straps are still included with options.

---

### 2.7.1.2

#### Using an Antistatic Mat

Place ESD-sensitive components such as motherboards, memory, and other PCBs on an antistatic mat.

## 2.7.2

### ESD Handling Procedure

- 1. Prepare an antistatic surface to set parts on during the removal, installation, or replacement process.**

Place ESD-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

- Antistatic bag used to wrap a Sun replacement part
- Sun ESD mat, part number 250-1088
- A disposable ESD mat (shipped with some replacement parts or optional system components)

- 2. Attach an antistatic wrist strap.**

When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis.

## 2.8

# Removing the Top Cover

The top cover and fan door are integrated.

---

**Note** – Some field-replaceable units (FRUs) require removal of the top cover.

---

1. **Unlatch the fan module door.** ([FIGURE 2-6](#)) [1]

Pull the two release tabs back to release the door. Rotate the fan door to the open position and hold it there.

2. **Press the top cover release button and slide the top cover toward the rear of the server, about a half-inch (12.7 mm).** [2]

3. **Lift up and remove the top cover.** [3]

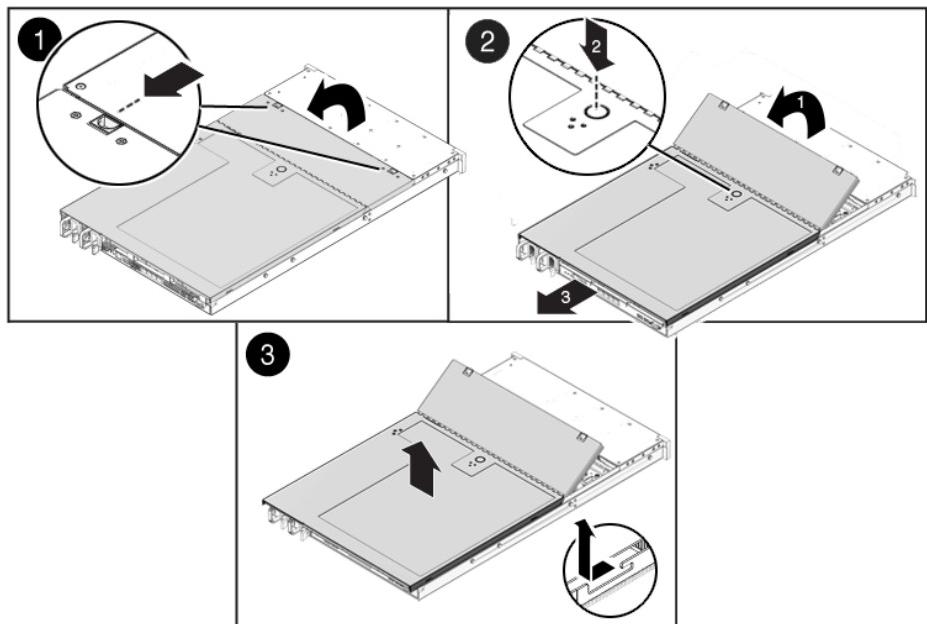


---

**Caution** – If the top cover is removed before the server is powered off, the server will immediately go into Standby mode.

---

**FIGURE 2-6** Removing the Sun Fire X4140 Server Top Cover







# Servicing Customer-Replaceable Devices

---

This chapter describes how to replace the hot-swappable and hot-pluggable customer-replaceable units (CRUs) in the Sun Fire X4140 Server.

The following topics are covered:

- [Section 3.1, “Devices That Are Hot-Pluggable or Hot-Swappable” on page 3-1](#)
  - [Section 3.2, “Servicing Drives” on page 3-2 \(CRU\)](#)
  - [Section 3.3, “Servicing Fan Modules” on page 3-9 \(CRU\)](#)
  - [Section 3.4, “Servicing Power Supplies” on page 3-14 \(CRU\)](#)
- 

## 3.1 Devices That Are Hot-Pluggable or Hot-Swappable

Some of the procedures in this section are for customer-replaceable units (CRUs) and some are for field-replaceable units (FRUs), as noted in the procedures. FRU components should be replaced only by trained service technicians. Contact your Sun Service representative for assistance with FRU replacements.

### 3.1.1 Hot-Pluggable Devices

Hot-pluggable devices are those devices that you can remove and install while the server is running, but you must perform administrative tasks before or after installing the hardware (for example, mounting a hard drive or SSD).

In the Sun Fire X4140 Server, drives are hot-pluggable. To hot-plug a drive you must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it. See [Section 3.2, “Servicing Drives” on page 3-2](#).

### 3.1.2 Hot-Swappable Devices

Hot-swappable devices are those devices that can be removed and installed while the server is running without affecting the rest of the server’s capabilities.

In the Sun Fire X4140 Server, the following devices are hot-swappable:

- Fan modules. See [Section 3.3, “Servicing Fan Modules” on page 3-9](#).
- Power supplies. See [Section 3.4, “Servicing Power Supplies” on page 3-14](#).

---

**Note** – The chassis-mounted drives can be hot-swappable, depending on how they are configured. See [Section 3.2, “Servicing Drives” on page 3-2](#).

---

## 3.2 Servicing Drives

The following topics are covered:

- [Section 3.2.1, “Sun Fire X4140 Server Drive Guidelines” on page 3-2](#)
- [Section 3.2.2, “Sun Fire X4140 Server Solid-State Drive Guidelines” on page 3-3](#)
- [Section 3.2.3, “Drive Status LED Reference” on page 3-5](#)
- [Section 3.2.4, “Removing a Hard Drive or SSD” on page 3-5](#)
- [Section 3.2.5, “Installing a Hard Drive or SSD” on page 3-7](#)
- [Section 3.2.6, “Using Drive Fillers” on page 3-8](#)

---

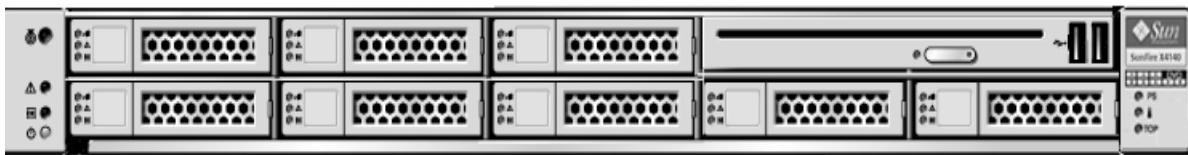
**Note – CRU:** These customer-replaceable units can be replaced by anyone.

---

### 3.2.1 Sun Fire X4140 Server Drive Guidelines

[TABLE 3-1](#) shows physical drive locations for the Sun Fire X4140 Server with 8 drives. [FIGURE 3-1](#) shows the server front panel, and [FIGURE 3-2](#) shows the drive status LEDs.

**FIGURE 3-1** Server Front Panel



**TABLE 3-1** Physical Drive Locations

Drive 1	Drive 3	Drive 5	DVD drive	
Drive 0	Drive 2	Drive 4	Drive 6	Drive 7

### 3.2.2 Sun Fire X4140 Server Solid-State Drive Guidelines

The X4150 server supports installing SSDs in the drive bays. Each SSD provides at least 32Gb of SATA capacity.

TABLE 3-1 shows drive numbers for a server with 4 SSDs and 4 hard drives. FIGURE 3-1 shows the front panel of a server with 8 drives.

**TABLE 3-1** Physical Drive Locations- SSD and Hard Drive Configuration

SSD1	SSD3	HD5	DVD drive	
SSD0	SSD2	HD4	HD6	HD7

The Sun Fire X4140 servers support solid-state drives (SSDs) under the following conditions:

Sun Fire X4140 with on-board controller:

- No SSDs can be installed.

Sun Fire X4140 with HBA:

- One to 4 SSDs can be installed. The remaining slots can be filled with hard drives that can equal up to 8 drives total. Example: 2 SSD and 6 hard drives.
- SSDs can be installed in any drive slot.

---

**Note –** You can create RAID volumes with SAS HDDs and SATA SSDs, as long as you do not mix them in a same volume.

---

The following cable kits are used for the HBA controller when using hard drives and SSDs:

**TABLE 3-2** Cable Kits for HBA Controller

System	Cable Kit	Order Number
Sun Fire X4140	SAS/SATA HBA (2 cables)	4280A

The following cable kits are used for the on-board controller with SSDs:

**TABLE 3-3** Cable Kits for HBA Controller

System	Cable Kit	Order Number
Sun Fire X4140	SATA On-Board Only (2 cables)	4281A

### 3.2.2.1 SSD Firmware Requirements

When replacing or installing a SSD to be included in a RAID configuration, in the Sun Fire X4140 system, make sure that the firmware on the newly installed SSD is the same as the firmware that is installed on the other SSDs in the RAID volume.

Miminum required firmware:

BIOS/ILOM Firmware

- BIOS: 0ABMN064
- ILOM: 3.0.3.37

Adaptec/LSI Firmware

- Adaptec FW: 15872
- LSI FW: 1.27.02, MPTBIOS: 6.26.00

Backplane Firmware

- Backplane FW: 5.02.04 (LSI SAS expander)

### 3.2.3 Drive Status LED Reference

FIGURE 3-2 shows the hard drive and SSD LED status indicators.

FIGURE 3-2 Drive Status LEDs

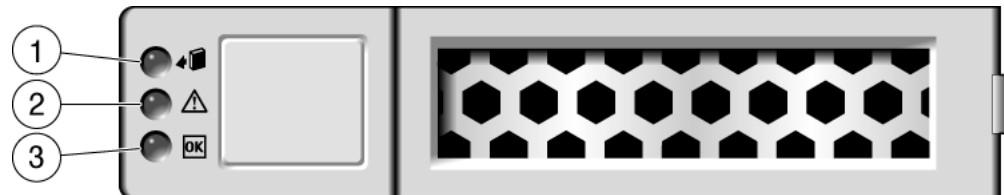


Figure Legend

Legend	LED	Symbol	Color	Lights when
1	OK to Remove		Blue	A drive can be removed safely during a hot-plug operation. <b>Note</b> - The blue "OK to Remove" LED requires OS support and is not operational with all operating systems.
2	Service Required		Amber	The system is running and the drive is faulty. The front and rear panel Service Required LEDs are also lit if the system detects a drive fault.
3	OK/Activity		Green	Data is being read from or written to the drive.

### 3.2.4 Removing a Hard Drive or SSD

Drives can be hot-plugged or cold-plugged. Drives in the Sun Fire X4140 Server might be hot-pluggable, depending on the drive configuration.

To hot-plug a drive you must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it.

To remove a drive from a Sun Fire X4140 Server:

**1. Identify the drive you wish to remove.**

The amber Service Required LED might be lit. For specific drive locations, see [Section 3.2.1, "Sun Fire X4140 Server Drive Guidelines" on page 3-2](#).

## **2. Determine if the drive can be hot-plugged, or cold-plugged.**

The following conditions might prevent you from hot-plugging a drive. You must power off the server, if the drive:

- Contains the operating system, and the operating system is not mirrored on another drive.
- Cannot be logically isolated from the online operations of the server.

## **3. Do one of the following:**

- **To hot-plug a drive:**

- i. **Unconfigure the drive, as required. You must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it.**

See one of the following HBA documents:

For Sun StorageTek: *Sun StorageTek RAID Manager Software User's Guide*

For LSI MegaRAID Storage Manager (MSM): *x64 Server Utilities Reference Manual*

- i. **Wait until the blue *OK to Remove* LED becomes lit ([FIGURE 3-2](#)) before you physically uninstall the drive from the chassis.**

The blue LED indicates that the drive is unconfigured and can be removed.

- **To cold-plug a drive:**

You must power off the server before you can safely remove the drive. Do one of the procedures described in [Section 2.4, “Powering Off the Server” on page 2-4](#).

## **4. On the drive you plan to remove, push the drive release button to open the latch ([1] [FIGURE 3-3](#)).**

## **5. Grasp the latch [2] and pull the drive out of the drive slot [3].**

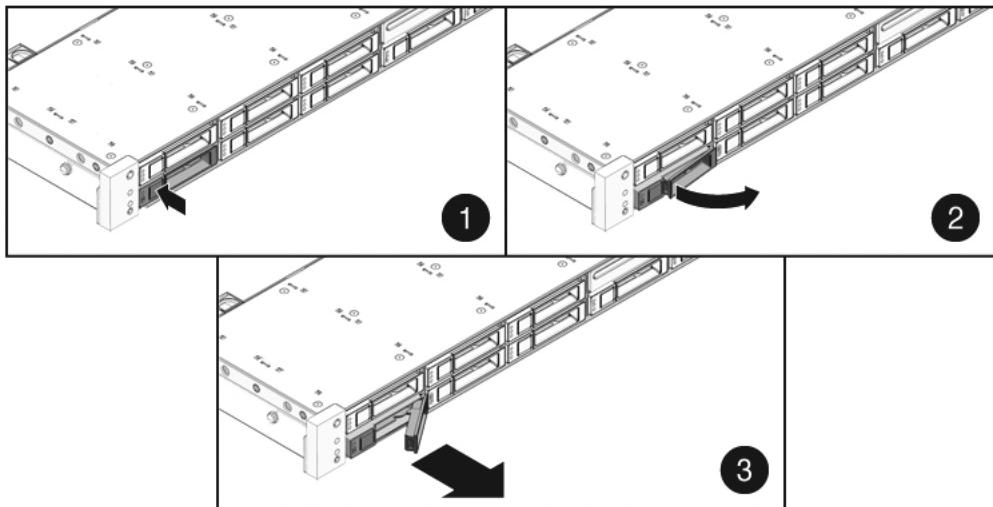


---

**Caution –** The latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

---

**FIGURE 3-3** Locating the Drive Release Button and Latch



### 3.2.5 Installing a Hard Drive or SSD

Installing a drive into the Sun Fire X4140 Server is a two-step process. You must first install a drive into the drive slot, and then configure that drive to the server.



**Caution** – Before inserting a replacement drive, wait 15 seconds, and verify that your monitoring/administration application has detected the missing/failed drive.

To install a drive into a Sun Fire X4140 Server:

**1. If necessary, remove the drive fillers from the chassis.**

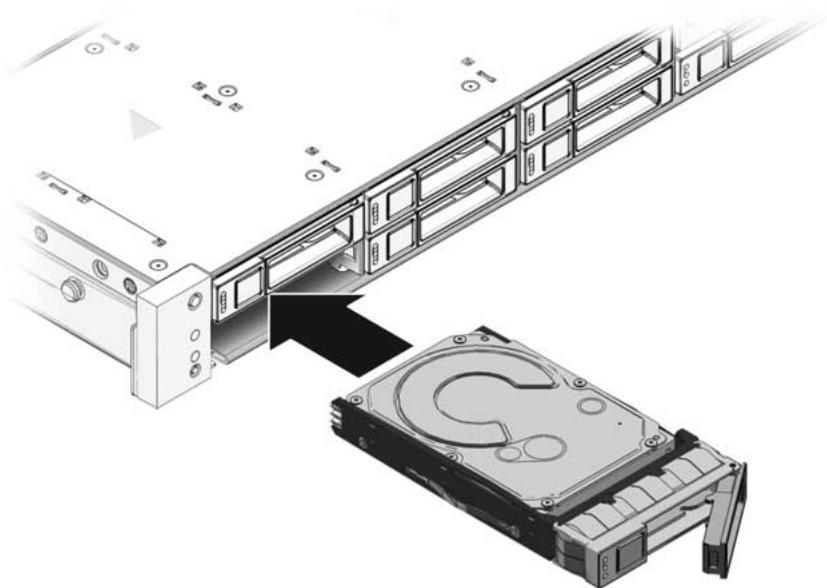
The Sun Fire X4140 Server might have as many as eight drive fillers covering unoccupied drive slots.

**2. Determine the drive slot location for the replacement drive.**

If you removed an existing drive from a slot in the server, you must install the replacement drive in the same slot as the drive that was removed. Drives are physically addressed according to the slot in which they are installed. See [TABLE 3-1](#) for drive locations.

**3. Slide the drive into the drive slot until it is fully seated ([FIGURE 3-4](#)).**

**FIGURE 3-4** Installing a Drive



**4. Close the latch to lock the drive in place.**

**5. Do one of the following:**

- **If you have hot-plugged the drive:**

Configure the drive. See one of the following HBA documents:

For Sun StorageTek: *Sun StorageTek RAID Manager Software User's Guide*

For LSI MegaRAID Storage Manager (MSM): *x64 Server Utilities Reference Manual*

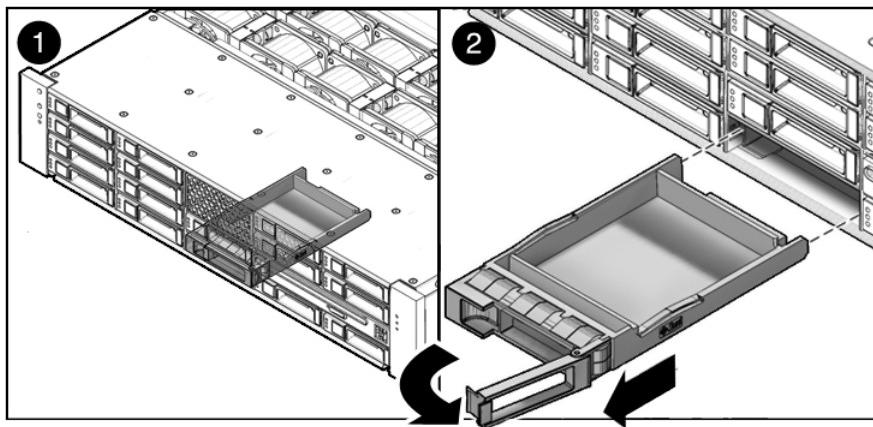
- **If you have cold-plugged the drive:**

Restore power to the server. Do the procedure described in [Section 6.4, "Powering On the Server" on page 6-5](#).

### 3.2.6 Using Drive Fillers

All drive slots in the Sun Fire X4240 Server must have drive fillers in place during operation to maintain airflow. To remove fillers, pull the ejector and pull the filler out of the chassis. ([FIGURE 3-5](#))

**FIGURE 3-5** Drive Filler



## 3.3 Servicing Fan Modules

The following topics are covered:

- [Section 3.3.1, “About Sun Fire X4140 Server Fans” on page 3-9](#)
- [Section 3.3.2, “Fan Module LED Reference” on page 3-10](#)
- [Section 3.3.3, “Detecting Fan Module Failure” on page 3-11](#)
- [Section 3.3.4, “Removing a Fan Module” on page 3-11](#)
- [Section 3.3.5, “Installing a Fan Module” on page 3-12](#)

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---

### 3.3.1 About Sun Fire X4140 Server Fans

Seven pairs of fan modules are located under the top cover door, providing N+1 cooling redundancy. Each fan module contains two fans mounted in an integrated, hot-swappable CRU.

If a fan module fails, replace the fan as soon as possible to maintain server availability.

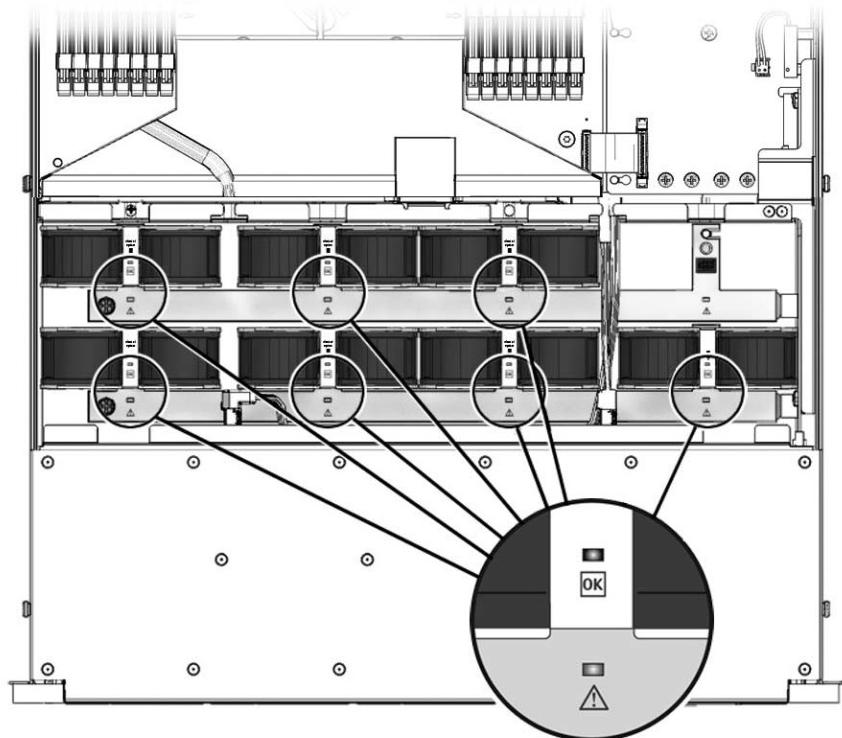
### 3.3.2 Fan Module LED Reference

Each fan module contains LEDs that are visible when you open the fan tray access door. [TABLE 3-4](#) describes fan tray module LEDs and their functions. [FIGURE 3-6](#) shows fan tray module LED locations.

**TABLE 3-4** Fan Module Status LEDs

LED	Color	Lights when...
Power/OK	Green 	The system is powered on and the fan module is functioning correctly.
Service Required	Amber 	The fan module is faulty. The front and rear panel Service Required LEDs are also lit if the system detects a fan module fault.

**FIGURE 3-6** Fan Module Status LEDs



See [Section 1.2, “Sun Fire X4140 Server Chassis Overview” on page 1-3](#) for more information about system status LEDs.

### 3.3.3 Detecting Fan Module Failure

The following LEDs are lit when a fan module fault is detected:

- Front and rear Service Required LEDs
- Top Fan LED on the front of the server
- Fan Fault LED on or adjacent to the faulty fan module

If an overtemperature condition occurs, the front panel processor overtemperature LED becomes lit and a message is displayed on the console and logged by the ILOM.

The system Overtemp LED might be lit if a fan fault causes an increase in system operating temperature. See [Section 1.3, “Sun Fire X4140 Server Front Panel Features” on page 1-8](#) for more information about identifying and interpreting system LEDs.

### 3.3.4 Removing a Fan Module



---

**Caution –** Hazardous moving parts. Unless the power to the server is completely shut down, the only service permitted in the fan compartment is the replacement of the fan modules by trained personnel.

---

**1. Extend the server into the maintenance position.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**2. Unlatch the fan module door.**

Pull the release tabs back to release the door. Open the top cover toward the rear of the server.

---

**Note –** Close the top cover door immediately after replacing the fan to maintain airflow in the server. Leaving the door open for more than 60 seconds while the server is running might cause the server to overheat and shut down.

---

**3. Identify the faulty fan module with a corresponding Service Required LED.**

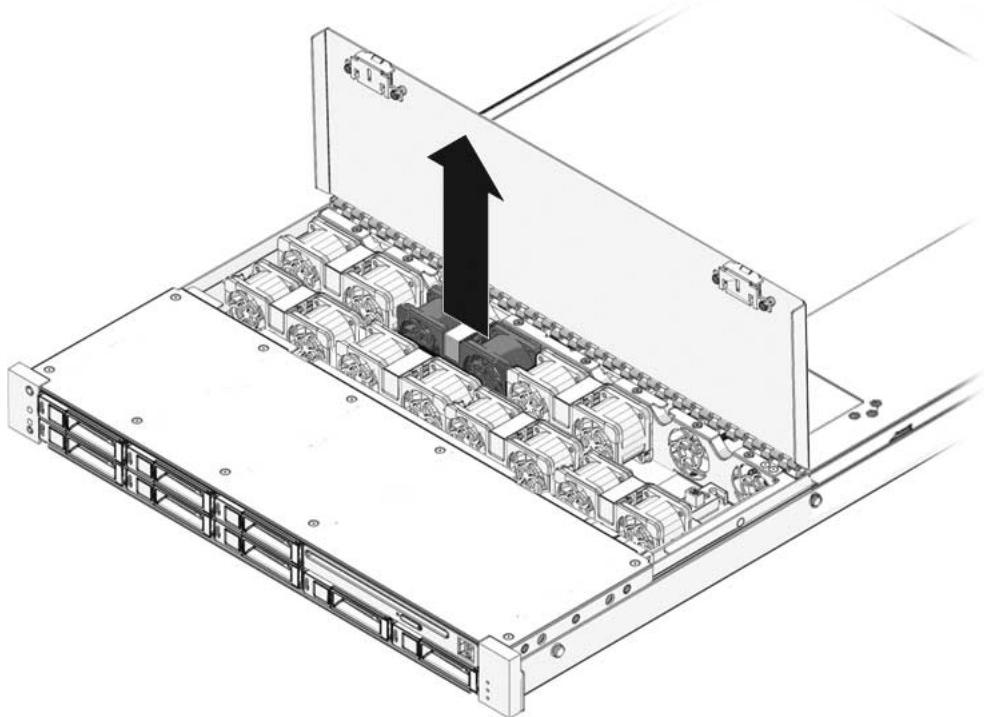
The Fan Fault LEDs are located on the fan board.

**4. Using thumb and forefinger in between the two fans, pull the fan module up and out of the connector.**



**Caution** – When changing the fan modules, note that only the fan modules can be removed or replaced. Do not service any other components in the fan compartment unless the system is shut down and the power cords are removed.

**FIGURE 3-7** Removing a Fan Module.

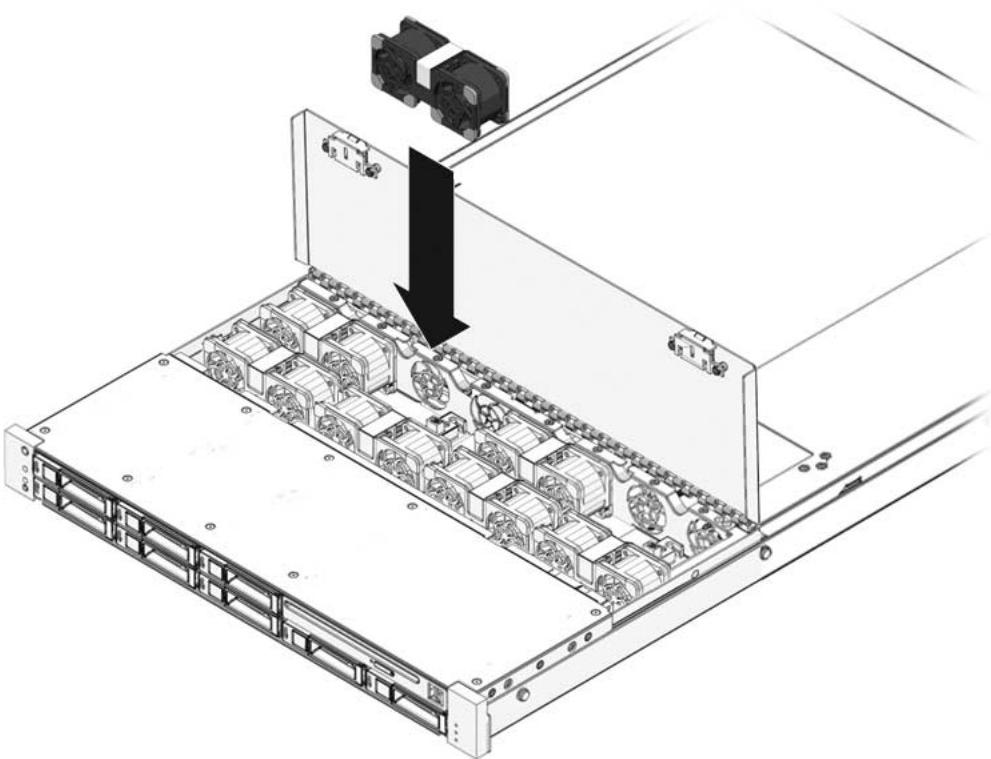


### 3.3.5 Installing a Fan Module

1. With the top cover door open, install the replacement fan module into the server ([FIGURE 3-8](#)).

The fan modules are keyed to ensure that they are installed in the correct orientation.

**FIGURE 3-8** Installing a Fan Module



2. Apply firm pressure to fully seat the fan module.
3. Verify that Fan OK LED is lit, and that the Fan Fault LED on the replaced fan module is not lit.
4. Close the top cover door.
5. Verify that the Top Fan LED, Service Required LEDs, and the Locator LED/Locator button are not lit.

See [Section 1.3, “Sun Fire X4140 Server Front Panel Features”](#) on page 1-8 for more information about identifying and interpreting system LEDs.

## 3.4 Servicing Power Supplies

Some versions of the Sun Fire X4140 Servers are equipped with redundant hot-swappable power supplies. Redundant power supplies enable you to remove and replace a power supply without shutting the server down, if the other power supply is online and working.

If a power supply fails and you do not have a replacement available, leave the failed power supply installed to ensure proper air flow in the server.

See [Section 3.4.2, “Power Supply LED Reference” on page 3-14](#) for specific information about power supply status LEDs.

The following topics are covered:

- [Section 3.4.1, “Detecting Power Supply Failure” on page 3-14](#)
- [Section 3.4.2, “Power Supply LED Reference” on page 3-14](#)
- [Section 3.4.3, “Removing a Power Supply” on page 3-15](#)
- [Section 3.4.4, “Installing a Power Supply” on page 3-17](#)

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---

### 3.4.1 Detecting Power Supply Failure

The following LEDs are lit when a power supply fault is detected:

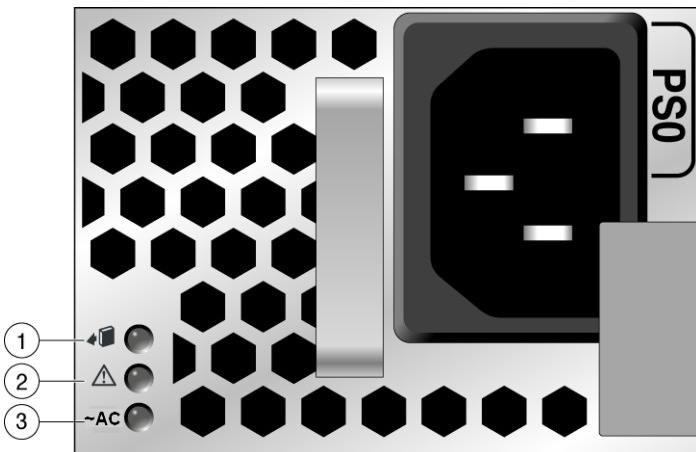
- Front and rear Service Required LEDs
- Rear PS Failure LED on the bezel of the server
- Failure LED on the faulty power supply

See [Section 1.3, “Sun Fire X4140 Server Front Panel Features” on page 1-8](#) and [Section 1.4, “Sun Fire X4140 Server Rear Panel Features” on page 1-9](#) for more information about identifying and interpreting system LEDs.

### 3.4.2 Power Supply LED Reference

Each power supply contains a series of LEDs on the rear panel of the system.

**FIGURE 3-9** Power Supply Status LEDs



**Figure Legend**

Legend	LED	Symbol	Color	Lights when
1	OK to Remove		Blue	A power supply can be removed safely during a hot-swap operation.
2	Service Required		Amber	The power supply is faulty. The front and rear panel Service Required LEDs are also lit if the system detects a power supply fault.
3	AC Present		Green	The power supply is plugged in and AC power is available, regardless of system power state.

### 3.4.3

### Removing a Power Supply



**Caution –** Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

**1. Identify which power supply (0 or 1) requires replacement.**

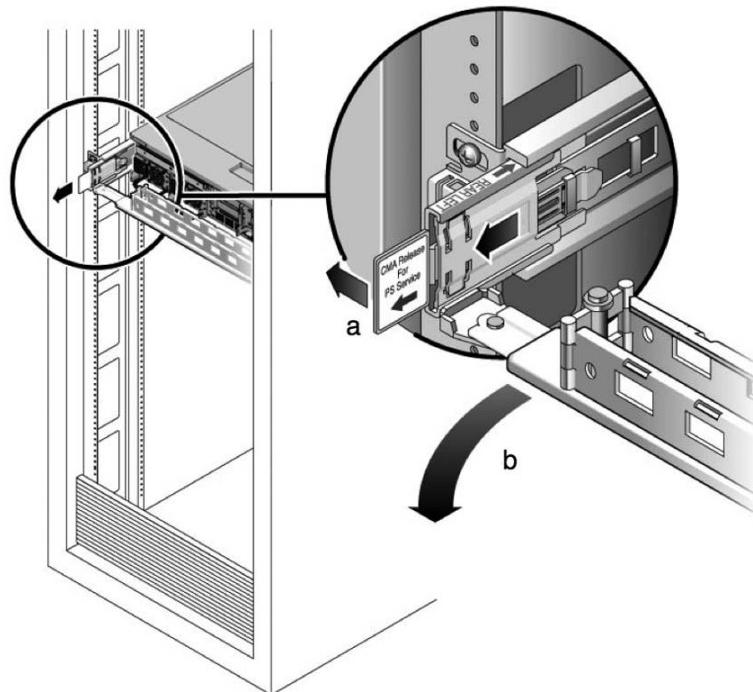
A lit (amber) failure LED on a power supply indicates that a failure was detected.

**2. Gain access to the rear of the server where the faulty power supply is located.**

**3. Release the cable management arm (CMA) ([FIGURE 3-10](#)).**

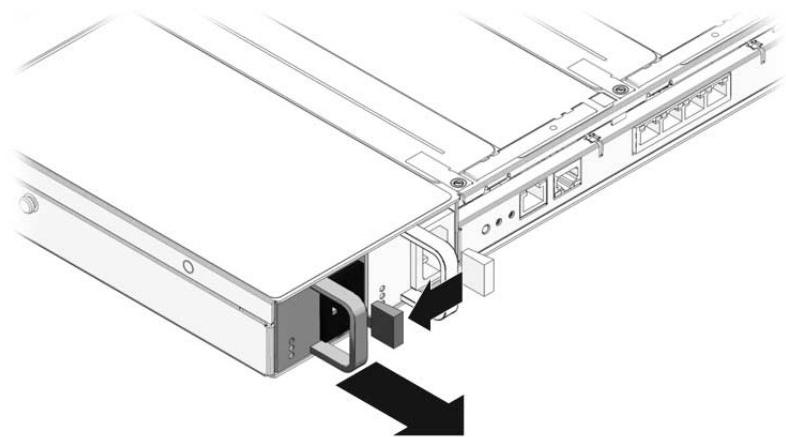
The CMA is located at the rear of the server rack.

**FIGURE 3-10** Releasing the Cable Management Arm



- a. Press and hold the tab.
- b. Rotate the cable management arm out of the way so that you can access the power supply.
4. Disconnect the power cord from the faulty power supply.
5. Grasp the power supply handle and press the release latch ([FIGURE 3-11](#)).
6. Pull the power supply out of the chassis.

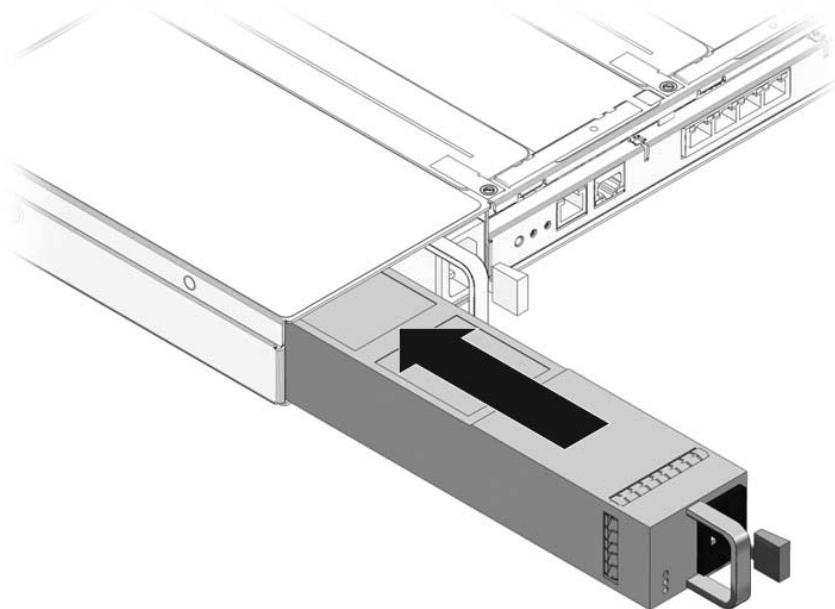
**FIGURE 3-11** Power Supply Release Handle



### 3.4.4 Installing a Power Supply

1. Align the replacement power supply with the empty power supply chassis bay.
2. Slide the power supply into the bay until it is fully seated ([FIGURE 3-12](#)).

**FIGURE 3-12** Installing a Power Supply



3. **Reconnect the power cord (or cords) to the power supply (or supplies).**  
Verify that the AC Present LED is lit.
4. **Close the CMA, inserting the end of the CMA into the rear left rail bracket (FIGURE 3-10).**
5. **Verify that the following LEDs are not lit:**
  - Failure LED on the replaced power supply
  - Service Required LED
  - Front Service Required LED
  - Rear Service Required LED

---

**Note** – See [Section 1.3, “Sun Fire X4140 Server Front Panel Features” on page 1-8](#) and [Section 1.4, “Sun Fire X4140 Server Rear Panel Features” on page 1-9](#) for more information about identifying and interpreting system LEDs.

---

6. **Verify the status of the power supplies.**

Solaris OS: At the -> prompt, type the `showenvironment` command.

# Servicing Motherboard Components

---

This chapter describes how to replace the motherboard and its components in the Sun Fire X4140 Server.

---

**Note** – Before performing any of the procedures in this chapter, perform the procedures described in [Chapter 2, Preparing to Service the System](#).

---

The following topics are covered in this chapter:

- [Section 4.1, “Servicing DDR2 DIMMs” on page 4-2](#) (CRU)
- [Section 4.2, “Servicing the Air Baffle” on page 4-10](#) (CRU)
- [Section 4.3, “Servicing PCIe Risers” on page 4-13](#) (CRU)
- [Section 4.4, “Servicing PCIe Cards” on page 4-15](#) (CRU)
- [Section 4.5, “Servicing the Battery” on page 4-19](#) (CRU)
- [Section 4.6, “Servicing the Motherboard Assembly” on page 4-21](#) (FRU)
- [Section 4.7, “Servicetool FRU Update Procedures” on page 4-27](#)
- [Section 4.8, “Servicing Processors” on page 4-30](#) (FRU)
- [Section 4.9, “Resetting Passwords and Clearing CMOS NVRAM” on page 4-35](#)
- [Section 4.10, “Recovering From Corrupt Service Processor Software” on page 4-37](#)
- [Section 4.11, “Using the Reset and NMI Switches” on page 4-39](#)



**Caution** – Never attempt to run the server with the covers removed. Hazardous voltage present.

---



**Caution** – Equipment damage possible. The covers must be in place for proper air flow.

---

## 4.1 Servicing DDR2 DIMMs

This section describes how to diagnose and replace faulty DDR2 DIMMs (DDR2 DIMMs). The following topics are covered:

- [Section 4.1.1, “Identifying Faulty DDR2 DIMMs” on page 4-2](#)
- [Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3](#)
  - Includes additional DDR2 DIMM information.
- [Section 4.1.3, “Removing DDR2 DIMMs” on page 4-6](#)
- [Section 4.1.4, “Installing DDR2 DIMMs” on page 4-7](#)
- [Section 4.1.5, “Installing Additional DDR2 DIMMs” on page 4-9](#)
  - How to upgrade the server with additional DDR2 DIMMs.

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---



**Caution** – This procedure requires that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

---

### 4.1.1 Identifying Faulty DDR2 DIMMs

The Sun Fire X4140 Server Service Required LED is lit if the system detects a DDR2 DIMM fault.

To use the rear panel Locator button to identify faulty DDR2 DIMMs:

1. **Unplug all power cords from the rear panel.**
2. **Press the remind button ([FIGURE 4-1](#)).**
3. **Note the location of faulty DDR2 DIMMs.**

Faulty DDR2 DIMMs are identified with a corresponding amber LED on the motherboard.

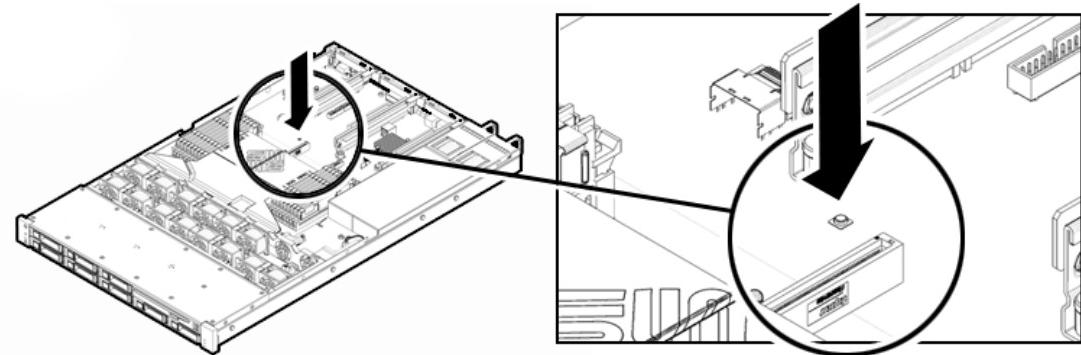
4. **Ensure that all DDR2 DIMMs are seated correctly in their slots. If re-seating the DIMM does not fix the problem, remove and replace the faulty DIMM.**

---

**Note** – Refer to the *Sun Fire X4140, X4240, and X4440 Servers Diagnostics Guide* for more information about DIMM System Event Log (SEL) messages.

---

**FIGURE 4-1** Remind Button



#### 4.1.2 DDR2 DIMM Guidelines

Use the DDR2 DIMM guidelines, and [FIGURE 4-2](#) to help you plan the memory configuration of your server.

- The server has 16 slots on the motherboard, in two groups, that hold industry-standard DDR2 DIMM memory modules.
- The Sun Fire X4140 Server supports the following configurations, such as:
  - 2 DDR2 DIMMs
  - 4 DDR2 DIMMs
  - 6 DDR2 DIMMs
  - 8 DDR2 DIMMs
  - 16 DDR2 DIMMs (fully populated configuration)

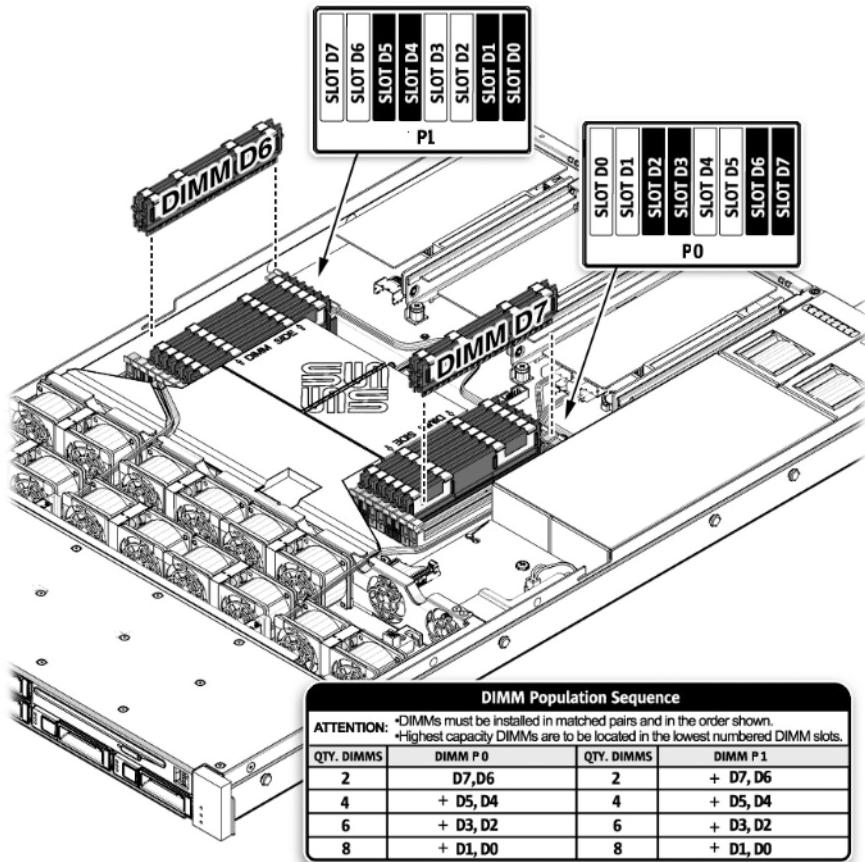
Any even number of DIMMs is allowed. The DIMMs must be populated in pairs and the pairs must be identical in organization, size and speed. See [FIGURE 4-2](#) for detailed configuration information.

- At minimum, Branch 0 must be populated with two DDR2 DIMMS of the same density (same type), same manufacturing part number.
- For optimum performance, all DIMMs controlled by a given processor should be the same capacity and all single-rank or dual-rank. Mixed configurations are supported, but could result in lower memory performance. Note that all

supported 4GB and 8GB DIMMs are dual-rank. For 1GB and 2GB DIMMs, you can identify the type by counting the DRAMs; single-rank DIMMs, have 18 DRAMs, while dual-rank DIMMs have 36 DRAMs.

Refer to the service label on the cover for DDR2 DIMM placement information. Refer to the *Sun Fire X4140, X4240, and X4440 Servers Diagnostics Guide* for additional DDR2 DIMM information.

**FIGURE 4-2** DDR2 DIMM Layout



#### 4.1.2.1 Viewing The Memory Configuration

Type the following in ILOM to view the memory configuration.

-> **show /SYS/MB/P0/D0/**

```
/SYS/MB/P0/D0
Targets:
    SERVICE

Properties:
    type = DIMM
    fru_name = 2048MB DDR-II 666
    fru_manufacturer = Hynix Semiconductor Inc.
    fru_version = 4141
    fru_part_number = HYMP525P72CP4-Y5
    fru_serial_number = 00005092

Commands:
    cd
    show
->
```

---

**Note** – DDR2 DIMM names in Integrated LOM messages are displayed with the full name, such as /SYS/MB/DIMM\_D0.

---

#### 4.1.2.2 Single Processor Configuration DDR2 DIMM Placement

If a one processor configuration is ordered, the DDR2 DIMM physical memory layout requires that all memory must be located next to the installed processor, working from the outside in. Do not install memory on the side that does not have a processor installed.

## 4.1.3

## Removing DDR2 DIMMs

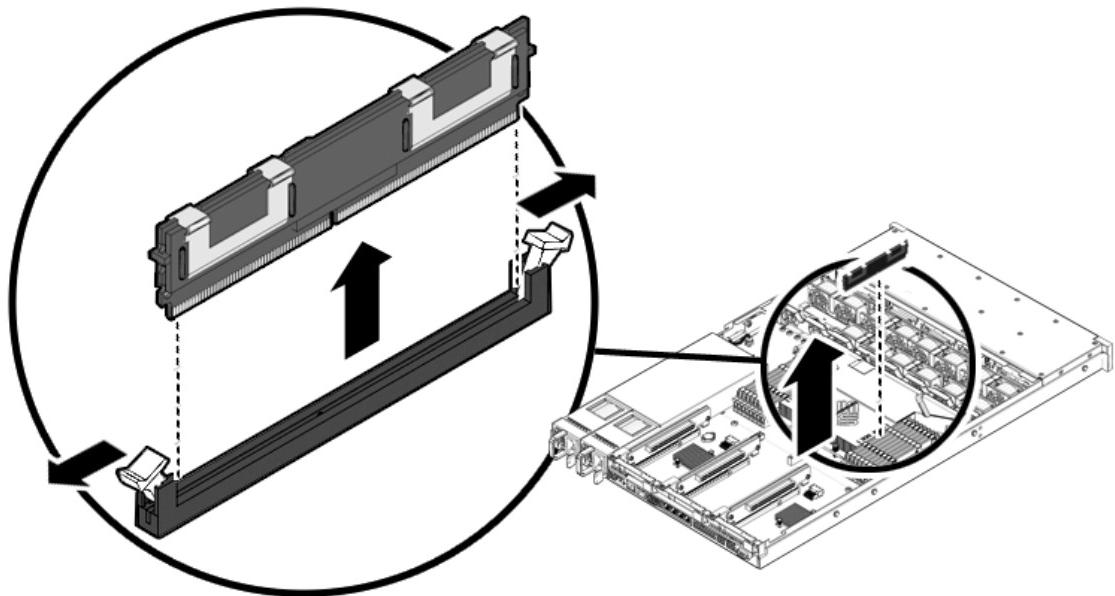


**Caution** – Ensure that all power is removed from the server before removing or installing DDR2 DIMMs. You must disconnect the power cables before performing this procedure.

1. Review [Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3 for memory configuration information](#).
2. Prepare the server for service.
  - a. Power off the server.  
See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - b. Disconnect the power cord (or cords) from the power supply (or supplies).  
See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - c. Extend the server into the maintenance position.  
See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).
  - d. Attach an antistatic wrist strap.  
See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).
  - e. Remove the top cover.  
See [Section 2.8, “Removing the Top Cover” on page 2-11](#).
3. If you are replacing a faulty DDR2 DIMM, press the “Remind” button to activate the DDR2 DIMM status LEDs after power is removed.  
All faulty DDR2 DIMMs are indicated with an amber LED on the motherboard, so that you can install the replacement DDR2 DIMM in the same location.

- 
- Tip** – Make a note of the faulty DDR2 DIMM location.
- 
4. Push down on the ejector tabs on each side of the DDR2 DIMM until the FB-DIMM is released ([FIGURE 4-3](#)).
  5. Grasp the top corners of the faulty DDR2 DIMM and remove it from the server.

**FIGURE 4-3** Removing DDR2 DIMMs



6. Place the DDR2 DIMM on an antistatic mat.
7. Repeat Step 4 through Step 6 to remove any additional DDR2 DIMMs.

#### 4.1.4

#### Installing DDR2 DIMMs



**Caution** – Ensure that all power is removed from the server before removing or installing DDR2 DIMMs, or damage to the DDR2 DIMMs might occur. You must disconnect all power cables from the system before performing this procedure.

---

**Tip** – See Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3 for information about configuring the DDR2 DIMMs.

---

1. Unpackage the replacement DDR2 DIMMs and place them on an antistatic mat.
2. Ensure that the ejector tabs are in the open position.

**3. Line up the replacement DDR2 DIMM with the connector (FIGURE 4-4).**

Align the DDR2 DIMM notch with the key in the connector. This ensures that the DDR2 DIMM is oriented correctly.

**4. Push the DDR2 DIMM into the connector until the ejector tabs lock the DDR2 DIMM in place.**

If the DDR2 DIMM does not easily seat into the connector, verify that the orientation of the DDR2 DIMM is as shown in [FIGURE 4-4](#). If the orientation is reversed, damage to the DDR2 DIMM might occur.

**5. Repeat Step 2 through Step 4 until all replacement DDR2 DIMMs are installed.**

**6. Install the top cover.**

See [Section 6.1, “Installing the Top Cover”](#) on page 6-2.

**7. Slide the server into the rack.**

See [Section 6.3, “Returning the Server to the Normal Rack Position”](#) on page 6-4.

**8. Reconnect the power cord (or cords) to the power supply (or supplies).**

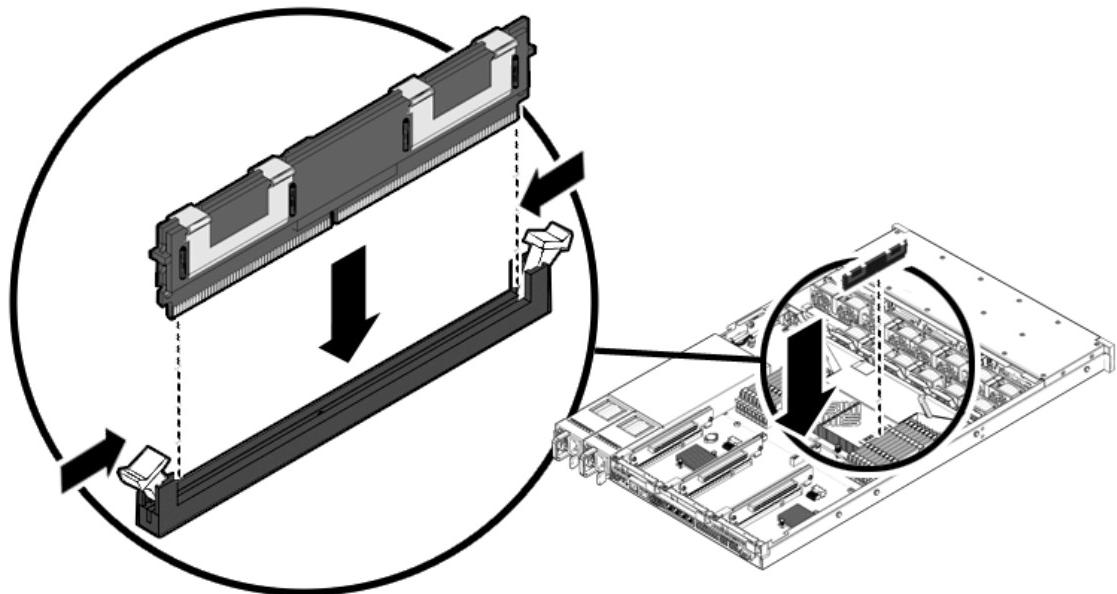
Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

**9. Power on the server.**

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

**FIGURE 4-4** Installing DDR2 DIMMs



#### 4.1.5

#### Installing Additional DDR2 DIMMs

Before you begin, see [Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3](#), for information about DDR2 DIMM configuration guidelines.



**Caution** – Ensure that all power is removed from the server before installing DDR2 DIMMs or damage to the DDR2 DIMMs might occur. You must disconnect all power cables from the system before performing this procedure.

1. Unpackage the replacement DDR2 DIMMs and place them on an antistatic mat.
2. Ensure that the ejector tabs are in the open position.
3. Line up the DDR2 DIMM with the connector ([FIGURE 4-4](#)).

Align the DDR2 DIMM notch with the key in the connector. This ensures that the DDR2 DIMM is oriented correctly.

4. Push the DDR2 DIMM into the connector until the ejector tabs lock the DDR2 DIMM in place.

If the DDR2 DIMM does not easily seat into the connector, verify that the orientation of the DDR2 DIMM is as shown in [FIGURE 4-4](#). If the orientation is reversed, damage to the DDR2 DIMM might occur.

5. Repeat Step 2 through Step 4 until all DDR2 DIMMs are installed.

6. Return the server to operation.

- a. Install the top cover.

See [Section 6.1, “Installing the Top Cover”](#) on page 6-2.

- b. Slide the server into the rack.

See [Section 6.3, “Returning the Server to the Normal Rack Position”](#) on page 6-4.

- c. Reconnect the power cord (or cords) to the power supply (or supplies).

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

- d. Power on the server.

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

---

## 4.2

## Servicing the Air Baffle

The following topics are covered:

- [Section 4.2.1, “Removing the Air Baffle”](#) on page 4-11
- [Section 4.2.2, “Installing the Air Baffle”](#) on page 4-12

You must remove the air baffle when removing and installing the motherboard.

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---



---

**Caution –** To prevent the system from overheating, ensure that the air baffle is correctly installed before powering on the server.

---

## 4.2.1 Removing the Air Baffle

### 1. Prepare the server for service.

#### a. Power off the server.

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### b. Disconnect the power cord (or cords) from the power supply (or supplies).

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### c. Slide the server out of the rack.

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

#### d. Attach an antistatic wrist strap.

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

#### e. Remove the top cover.

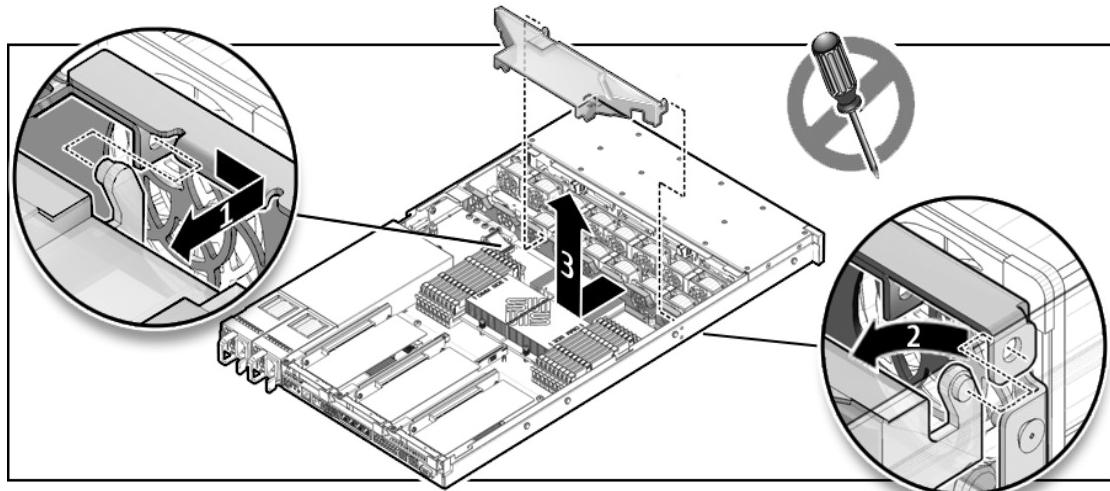
See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

### 2. Open the air baffle.

Slide the duct off of the screws and remove the air baffle as shown in [FIGURE 4-5](#).

### 3. Set the air baffle aside.

**FIGURE 4-5** Removing the Air Baffle



## 4.2.2 Installing the Air Baffle



**Caution** – When the server is in operation, ensure that the air baffle is correctly installed to prevent the system from overheating.

1. **Install the air baffle into the chassis as shown in FIGURE 4-6.**

Ensure that the air baffle is aligned and fully seated in the chassis.

2. **Return the server to operation.**

- a. **Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

- b. **Slide the server into the rack.**

See [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#).

- c. **Reconnect the power cord (or cords) to the power supply (or supplies).**

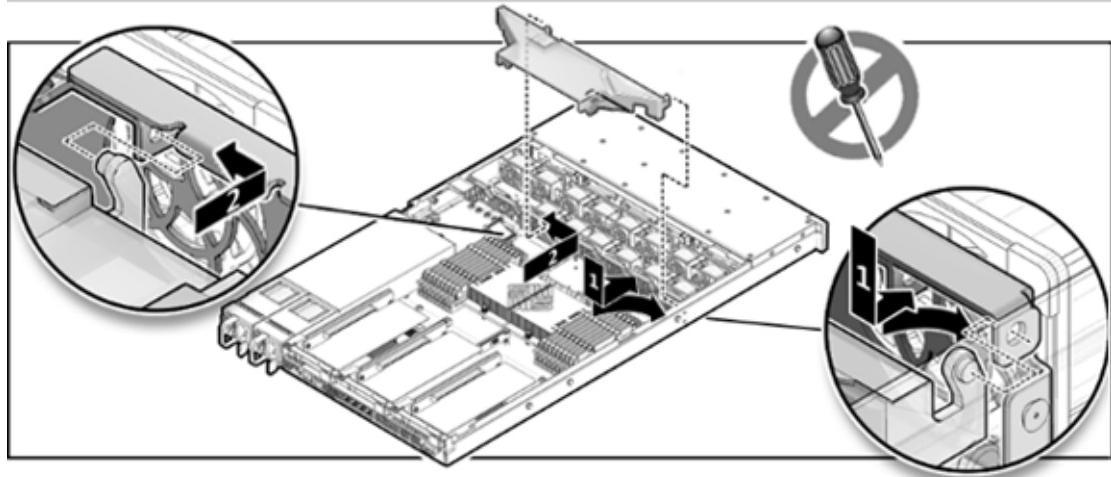
Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

- d. **Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**FIGURE 4-6** Installing the Air Baffle



## 4.3

# Servicing PCIe Risers

The following topics are covered:

- [Section 4.3.1, “Removing a PCIe Riser” on page 4-13](#)
- [Section 4.3.2, “Installing a PCIe Riser” on page 4-14](#)

PCIe cards are installed on vertical risers. You must remove the relevant riser to access a PCIe card. You must remove all three PCIe risers when replacing the motherboard.

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---



**Caution** – This procedure requires that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

---

### 4.3.1

## Removing a PCIe Riser



**Caution** – Ensure that all power is removed from the server before removing or installing risers. You must disconnect the power cables before performing this procedure.

---

### 1. Prepare the server for service.

#### a. Power off the server.

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### b. Disconnect the power cord (or cords) from the power supply (or supplies).

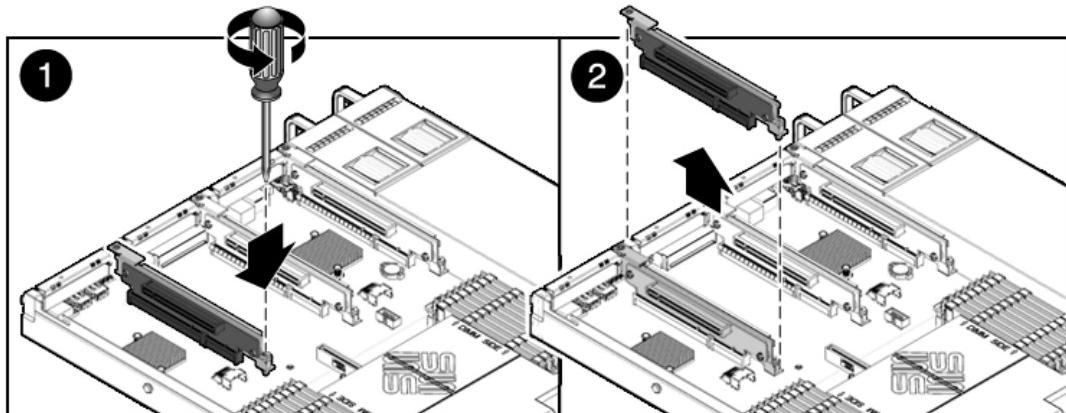
See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### c. Attach an antistatic wrist strap.

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

2. Disconnect any data cables connected to the cards on the PCIe riser being removed.  
Label the cables to ensure proper connection later.
3. Slide the server out of the rack.  
See [Section 2.5, “Extending the Server to the Maintenance Position”](#) on page 2-5.
4. If you are servicing a PCIe card, locate its position in the system.
5. Remove the rear panel crossbar.
  - a. Loosen the captive Phillips screw on each end of the rear panel crossbar.
  - b. Lift the crossbar up and back to remove it from the chassis.
6. Lift the riser up to remove it from the system ([FIGURE 4-7](#)).
  - a. Loosen the captive Phillips screw on the end of the riser.
  - b. Remove the riser and any PCIe cards attached to it as a unit.

**FIGURE 4-7** Removing a PCIe Riser



### 4.3.2 Installing a PCIe Riser



**Caution** – Ensure that all power is removed from the server before removing or installing risers. You must disconnect the power cables before performing this procedure.

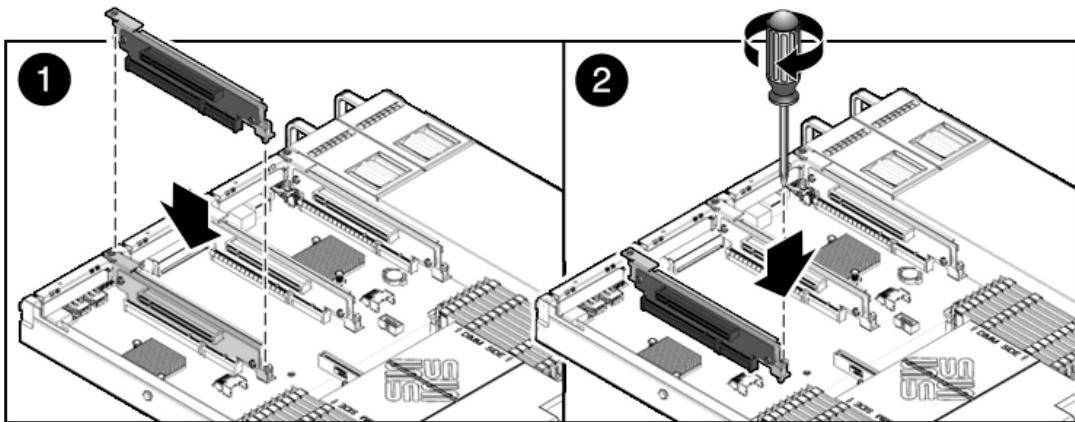
1. Lower the PCIe riser and any cards attached to it into the system.
2. Slide the back of the riser into the motherboard rear panel stiffener.
3. Install the screw that secures the riser to the motherboard ([FIGURE 4-8](#)).
4. Install the rear panel crossbar.

Slide the crossbeam down over the PCIe risers. The crossbar is secured with two captive Phillips screws.
5. **Slide the server into the rack.** See [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#).
6. Connect any data cables you removed to service the PCIe cards.
7. **Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**FIGURE 4-8** Installing a PCIe Riser



---

## 4.4 Servicing PCIe Cards

The following topics are covered:

- [Section 4.4.1, “Sun Fire X4140 Server PCIe Card Guidelines” on page 4-16](#)
- [Section 4.4.2, “Removing PCIe Cards” on page 4-17](#)
- [Section 4.4.3, “Installing PCIe Cards” on page 4-18](#)

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---



**Caution** – This procedure requires that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

---



**Caution** – Ensure that all power is removed from the server before removing or installing expansion cards. You must disconnect the power cables before performing this procedure.

---

## 4.4.1 Sun Fire X4140 Server PCIe Card Guidelines

### 4.4.1.1 Riser Cards

The PCI expansion system is configured using two types of riser cards.

Riser type 1 is used in the Riser 0 and Riser 1 positions and Riser type 2 is used in the slot 2 position as shown in [TABLE 4-1](#). The electrical width is the number of active PCIe lanes and the mechanical width describes the riser PCIe connector size. PCIe cards with x4, x8 or x16 mechanical finger pins will fit in any riser slot but will operate at the electrical lane width of the slot.

**TABLE 4-1** Sun Fire X4140 Server Riser Guidelines

Riser/Slot Numbers	Electrical	Mechanical	Source
Riser 0 - Slot 0	x8	x8	MCP55
Riser 1 - Slot 1	x8	x8	MCP55
Riser 2 - Slot 2	x16	x16	IO55

### 4.4.1.2 Guidelines for SGXPCIESAS-R-INT-Z HBA Card

The SGXPCIESAS-R-INT-Z HBA should be installed in slot 0 to avoid system overheating. Make sure that the firmware is at SW 3.1 or later when installing the HBA in Slot 0.

#### 4.4.2

## Removing PCIe Cards



**Caution** – Ensure that all power is removed from the server before removing or installing expansion cards. You must disconnect the power cables before performing this procedure.

1. Locate the PCIe card that you want to remove, and note its corresponding riser board.

See [Section 1.4, “Sun Fire X4140 Server Rear Panel Features” on page 1-9](#) for more information about PCIe slots and their locations.

2. If necessary, make a note of where the PCIe cards are installed.

3. Unplug all data cables from the card.

Note the location of all cables for reinstallation later.

4. Remove the riser board ([FIGURE 4-9](#)).

See [Section 4.3, “Servicing PCIe Risers” on page 4-13](#).

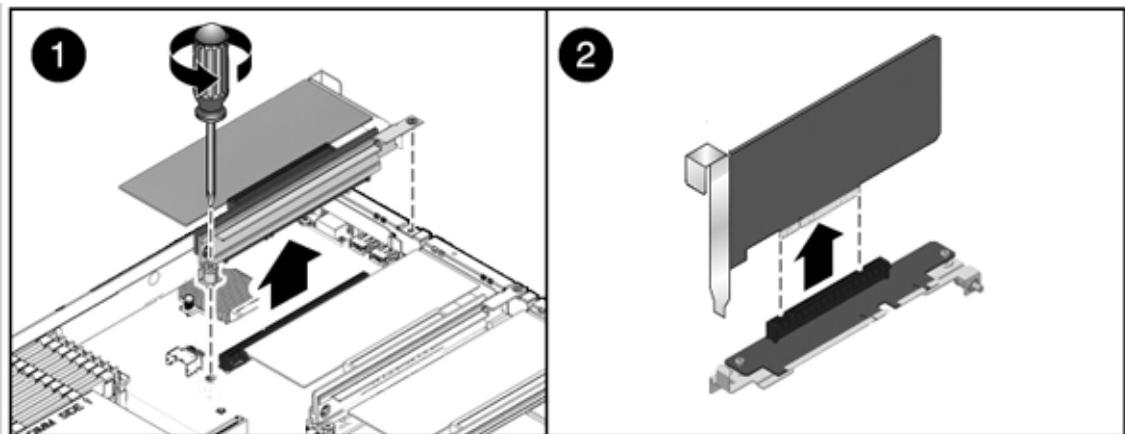
5. Carefully remove the PCIe card from the riser board connector.

6. Place the PCIe card on an antistatic mat.

7. If you are not replacing the PCIe card, install a PCIe filler panel.

PCIe filler panels are located in the motherboard rear panel.

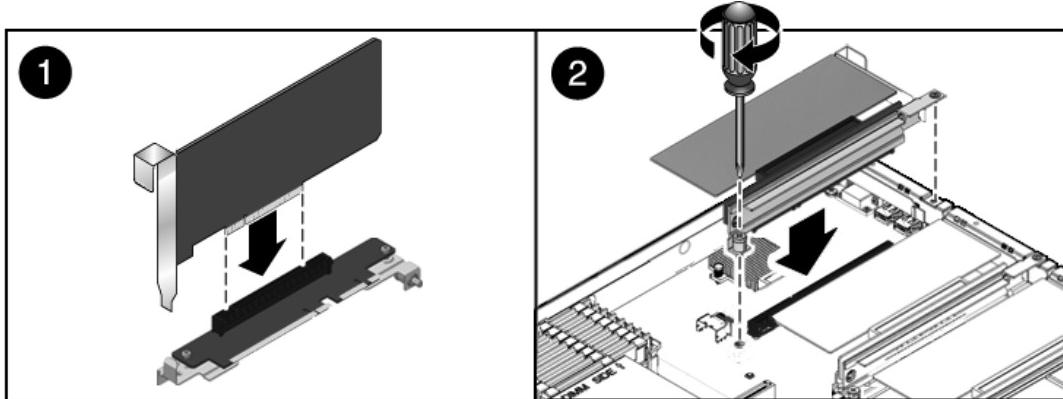
**FIGURE 4-9** Removing a PCIe Card



## 4.4.3 Installing PCIe Cards

1. Unpackage the replacement PCIe card and place it on an antistatic mat.
2. Locate the proper PCIe slot for the card you are replacing.
3. If necessary, review the PCIe Card Guidelines to plan your installation.  
See [Section 4.4.1, “Sun Fire X4140 Server PCIe Card Guidelines” on page 4-16](#) for additional information.
4. Remove the PCIe riser board.  
See [Section 4.3, “Servicing PCIe Risers” on page 4-13](#).
5. If the server has been continuously used for an extended time, inspect the slot for particles.  
Clean the slot with filtered, compressed air, as required.
6. Remove the PCI filler panel.  
PCIe filler panels are located in the motherboard rear panel.
7. Insert the PCIe card into the correct slot on the riser board ([FIGURE 4-10](#)).
8. Replace the riser board.
  - a. Slide the riser back until it seats in its slot in the rear panel.
  - b. Tighten the captive No. 2 Phillips screw securing the riser to the motherboard.
9. Return the server to operation.
  - a. Install the top cover.  
See [Section 6.1, “Installing the Top Cover” on page 6-2](#).
  - b. Slide the server into the rack.  
See [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#).
  - c. Connect any data cables required to the PCIe card.  
Route data cables through the cable management arm.
  - d. Reconnect the power cord (or cords) to the power supply (or supplies).  
Verify that the AC Present LED is lit.  
See [Section 6.4, “Powering On the Server” on page 6-5](#).
  - e. Power on the server.  
See [Section 6.4, “Powering On the Server” on page 6-5](#).

**FIGURE 4-10** Installing a PCIe Card



---

## 4.5 Servicing the Battery

The following topics are covered:

- [Section 4.5.1, “Removing the Battery” on page 4-20](#)
- [Section 4.5.2, “Installing the Battery” on page 4-20](#)

The battery maintains system time when the server is powered off and a time server is unavailable. If the server fails to maintain the proper time when powered off and not connected to a network, replace the battery.

You need a small (No. 1 flat-blade) screwdriver.

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

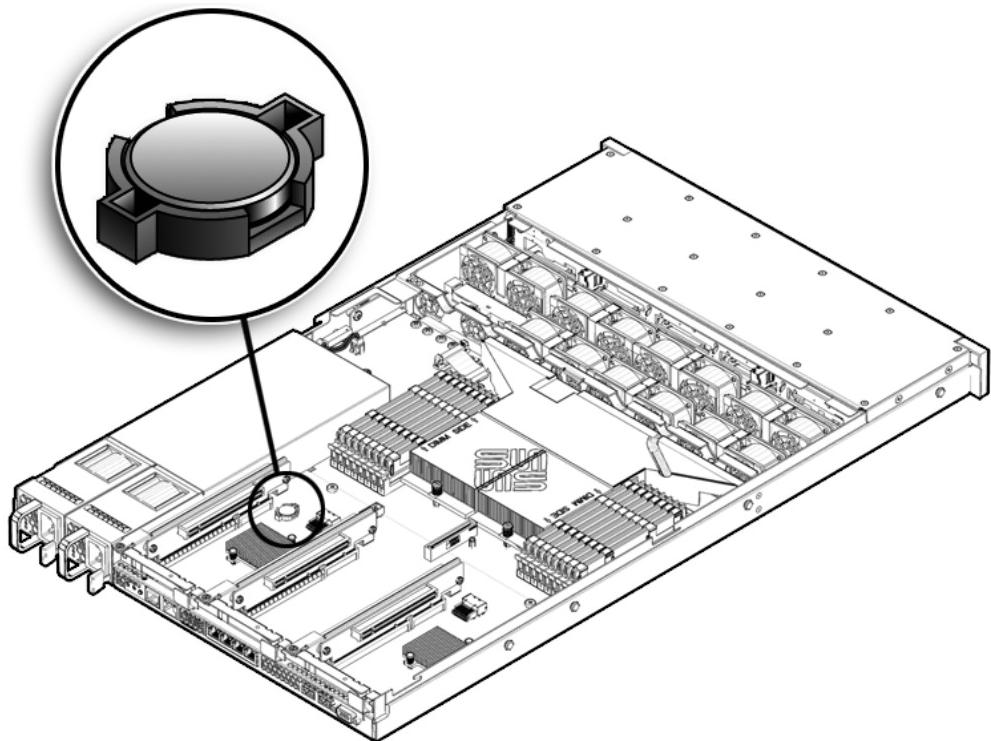
---



**Caution –** Ensure that all power is removed from the server before removing or installing the battery. You must disconnect the power cables from the system before performing this procedure.

---

**FIGURE 4-11** Battery Location



## 4.5.1 Removing the Battery

- 1. Remove PCIe riser 0.**

See [Section 4.3.1, “Removing a PCIe Riser” on page 4-13](#).

See [Section 4.4.1, “Sun Fire X4140 Server PCIe Card Guidelines” on page 4-16](#).

- 2. Using a small (No. 1 flat-blade) screwdriver, press the latch and remove the battery from the motherboard.**

## 4.5.2 Installing the Battery

- 1. Unpackage the replacement battery.**

- 2. Press the new battery into the motherboard.**

Install the positive side (+) facing upward, away from the motherboard.

### 3. Install PCIe riser 0.

See [Section 4.3.2, “Installing a PCIe Riser” on page 4-14](#).

### 4. Use the ILOM command to set the day and time. Type:

```
-> set /SP/clock datetime=MMDDhhmmYYYY (or MMDDhhmmYYYY.ss)
```

---

## 4.6

# Servicing the Motherboard Assembly

This section describes the following procedures:

- [Section 4.6.1, “Removing the Motherboard Assembly” on page 4-22](#)
- [Section 4.6.2, “Installing the Motherboard Assembly” on page 4-24](#)
- [Section 4.7, “Servicetool FRU Update Procedures” on page 4-27](#)

You must remove the motherboard assembly to access the following components:

- Power distribution board
- Paddle card

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---



---

**Caution –** Ensure that all power is removed from the server before removing or installing the motherboard assembly. You must disconnect the power cables from the system before performing this procedure.

---



---

**Caution –** This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause server components to fail. To avoid damage, ensure that you follow the antistatic practices as described in [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

---



---

**Caution –** This procedure requires removing the server from the rack. The server is heavy. Two people are required to remove it from the rack.

---

## 4.6.1 Removing the Motherboard Assembly

- 1. Prepare the server for service.**
  - a. Power off the server.**  
See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - b. Disconnect the power cord (or cords) from the power supply (or supplies).**  
See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - c. Remove the server from the rack.**  
See [Section 2.6, “Removing a Server From the Rack” on page 2-7](#).
  - d. Extend the server into the maintenance position.**  
See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).
  - e. Attach an antistatic wrist strap.**  
See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).
  - f. Remove the top cover.**  
See [Section 2.8, “Removing the Top Cover” on page 2-11](#).
- 2. Remove the air baffle.**  
See [Section 4.2.1, “Removing the Air Baffle” on page 4-11](#).
- 3. Remove the PCIe cards and risers.**  
See [Section 4.3.1, “Removing a PCIe Riser” on page 4-13](#). Make note of the location of expansion cards in the PCIe risers.
- 4. Disconnect the power distribution board ribbon cable.**
- 5. If you are replacing the motherboard, remove the DDR2 DIMMs.**  
Make note of the memory configuration so that you can install the DDR2 DIMMs in the replacement motherboard.
- 6. Disconnect the drive data cables.**



---

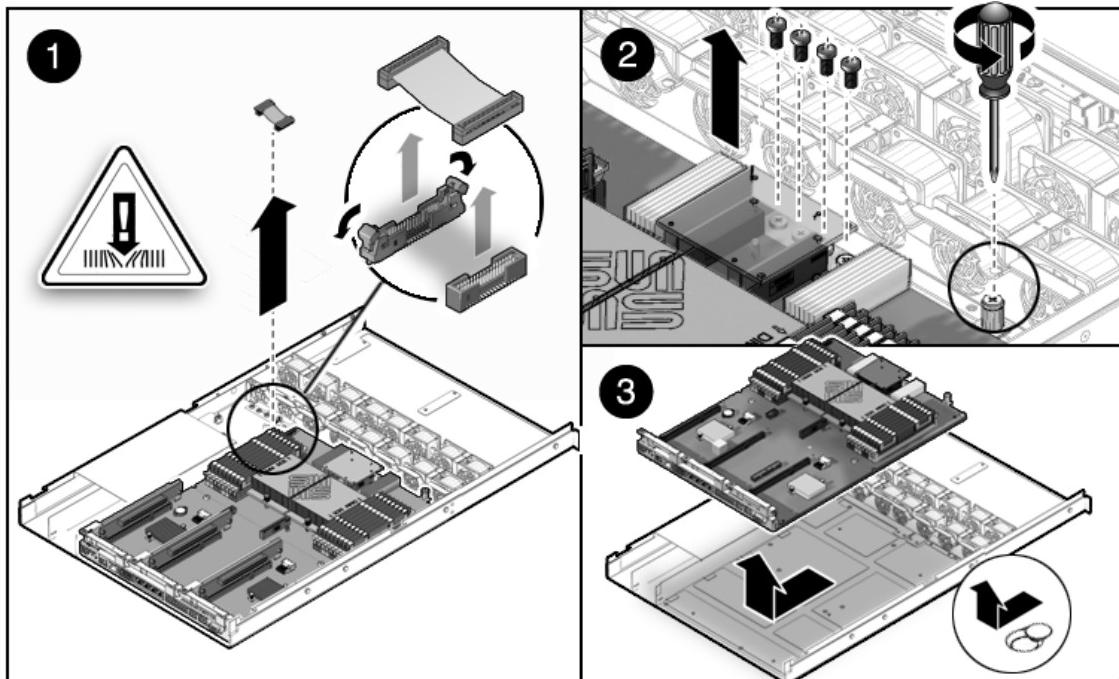
**Caution** – The drive data cables are delicate. Ensure they are safely out of the way when servicing the motherboard.

---

- 7. Remove the processor heat sinks from the motherboard assembly.**

8. Remove the 4 screws that secure the motherboard to the bus bar.  
Use a No. 2 Phillips screwdriver.
9. Loosen the green captive screw on the front of the motherboard, that secures the motherboard tray to the chassis.
10. Remove the plastic air flow bezel from between the fans and the motherboard.
11. If you are replacing the motherboard only, remove the processors, as required.
12. Lift the motherboard assembly out of the chassis ([FIGURE 4-12](#)).  
Move the motherboard carefully.
13. Place the motherboard assembly on an antistatic mat.

**FIGURE 4-12** Removing the Motherboard Assembly



#### 4.6.2 Installing the Motherboard Assembly



**Caution** – This procedure requires that you handle components that are sensitive to static discharge. Static discharges can cause the component failures. To avoid damage, ensure that you follow antistatic practices as described in [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures”](#) on page 2-9.

#### **1. Power off the server.**

See Section 2.4, “Powering Off the Server” on page 2-4.

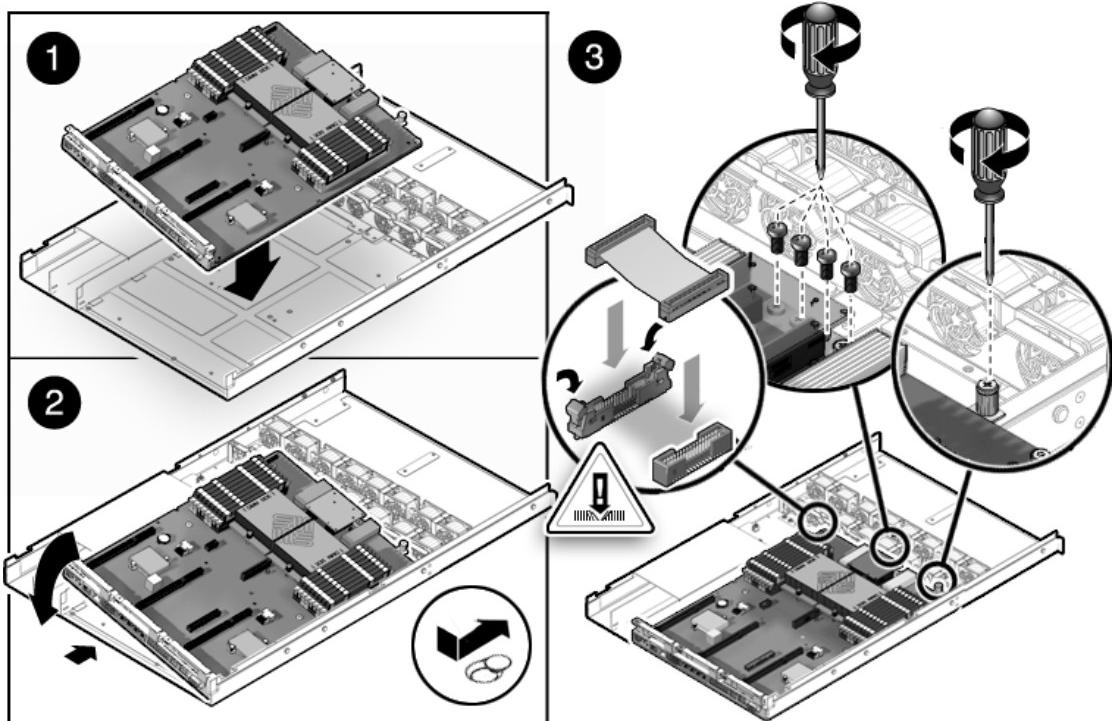
## **2. Attach an antistatic wrist strap.**

See Section 2.7, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-9.

### **3. Place the motherboard into the chassis (FIGURE 4-13).**

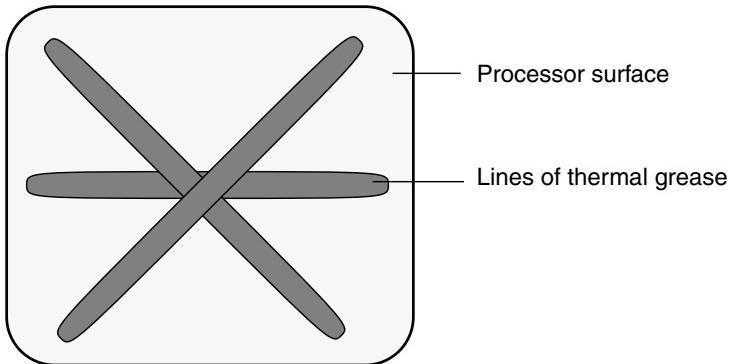
Position the motherboard carefully.

**FIGURE 4-13** Installing the Motherboard Assembly



4. **Install the 4 screws that secure the motherboard to the bus bar.**  
Torque screws to 7 inch-pounds (0.8 newton-meters). Use a manual torque driver settable to 7 inch-lbs (0.8 newton-meters) with a No. 2 Phillip screwdriver.
5. **Tighten the green captive screw on the front of the motherboard, that secures the motherboard tray to the chassis.**
6. **If you are replacing the motherboard only, replace the processors, as required.**  
Apply thermal grease. You need the a thermal grease kit to replace the processors. Follow the applicable grease procedure included with the grease.

**FIGURE 4-14** Required Pattern for Thermal Grease Application



7. **Install the plastic air flow bezel between the fans and the motherboard.**
8. **Install the processor heat sinks. See [Section 4.8.3, “Installing a Processor FRU” on page 4-32](#).**
9. **Carefully connect the power distribution board ribbon cable to the motherboard.**  
Make sure it is seated properly.
10. **Connect the two drive data cables.**



**Caution –** The drive data cables are delicate. Carefully connect them and make sure that they are seated properly when servicing the motherboard.

11. **Install all DDR2 DIMMs in the motherboard assembly.**

**Note –** Only install the DDR2 DIMMs in the slots (connectors) from which they were removed. See [Section 4.1.2, “DDR2 DIMM Guidelines” on page 4-3](#).

**12. Install the air baffle.**

See [Section 4.2.2, “Installing the Air Baffle” on page 4-12](#).

**13. Reinstall the PCIe cards and risers.**

See [Section 4.3.2, “Installing a PCIe Riser” on page 4-14](#).

**14. Return the server to operation.**

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**d. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**15. After you replace the board FRU, use the servicetool command to update FRU information about the board. See [Section 4.7, “Servicetool FRU Update Procedures” on page 4-27](#).**

---

## 4.7

## Servicetool FRU Update Procedures

The following topics are covered:

- [Section 4.7.1, “Updating FRU Product Information Using ServiceTool” on page 4-28](#)
- [Section 4.7.2, “Restoring Product Information From the FRUID PROM” on page 4-29](#)
- [Section 4.7.3, “Changing Product Information on the Motherboard Using a File” on page 4-30](#)

---

**Caution –** The SunService account is for the use of Sun service representatives only. Do not use the SunService account unless you are instructed to do so in a procedure developed by Sun Microsystems.

---

---

**Note** – If your system is running ILOM 3.x, then you must re-enable your SunService account.

---

---

**Note** – Before beginning these procedures, obtain Service/Escalation passwords from the Customer Support Center.

---

## 4.7.1 Updating FRU Product Information Using ServiceTool

1. Use SSH to log into the SunService account. The default password is **changeme**.

```
# ssh <SP IP address> -l sunservice  
# <SP IP Address>'s password: changeme
```

2. At the prompt, enter the **servicetool** command with options. The options are defined in the table below.

```
# servicetool --fru_update=serviceprocessor <OtherOptions>=<value>
```

Option	Description
--board_replaced=BOARD	Update FRU information for BOARD after it has been replaced. BOARD represents one of the following parameters: <ul style="list-style-type: none"><li>• mainboard</li><li>• pdb</li></ul>
--fru_product_part_number	Write a new product part number to mainboard and pdb FRUs.
--fru_product_serial_number	Write a new product serial number to mainboard and pdb FRUs.
--fru_chassis_serial_number	Write a new chassis serial number to mainboard and pdb FRUs.
--fru_chassis_part_number	Write a new chassis part number to mainboard and pdb FRUs.
--fru_asset_tag	Write a new asset tag to mainboard and pdb FRUs.

3. Watch the output from the command and respond to the confirmation prompts for continuing the update and rebooting the server:

Servicetool is going to collect system information for the service processor for future part swaps.

The following preconditions must be true for this to work:

- \* The new service processor must be installed.

Do you want to continue (y|n)? **y**

Service processor FRU information ready to be collected.

You MUST reboot the service processor for to complete this process. Allow the service processor to fully boot.

DO NOT UNPLUG THE SYSTEM WHILE THE SERVICE PROCESSOR IS BOOTING!

Would you like to reboot the service processor now (y|n)? **y**

The system is going down NOW!!

Sending SIGTERM to all processes.

## 4.7.2 Restoring Product Information From the FRUID PROM

1. In Escalation mode in ILOM, view product information on the FRUID PROM that is on the Power Distribution Board (PDB) by issuing this command:

```
# frutool -t pb --read_cmm_product_area
```

```
product part_number 594-5133-03
product serial_number 0829QAS003
product asset_tag NULL:16
chassis serial_number 0226LHF-0822B402YH
chassis part_number 540-7618-XX
```

2. Save the entire motherboard FRUID image, in case it later needs to be restored to its original state:

```
# frutool -r mb > /persist/mb.bin
```

3. Copy the product information from the PDB to a file:

```
# frutool -t pb --read_cmm_product_area >
/dev/shm/product.info
```

4. View the file by issuing the following command to verify the previous step was successful:

```
# cat /dev/shm/product.info
```

5. Write the product information to the motherboard by issuing this command:

```
# frutool -t mb --write_cmm_product_area <
/dev/shm/product.info
```

6. View the file to ensure that the product data has been updated in the motherboard FRUID PROM:

```
# frutool -r mb | hexdump -C | egrep '^000004'
```

00000400	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 a4 70 72   .....	.pr
00000410	6f 64 75 63 74 20 70 61	72 74 5f 6e 75 6d 62 65   oduct part_numbe	r 594-5133-03.pr
00000420	72 20 35 39 34 2d 35 31	33 33 2d 30 33 0a 70 72   r 594-5133-03.pr	
00000430	6f 64 75 63 74 20 73 65	72 69 61 6c 5f 6e 75 6d   oduct serial_num	ber 0829QAS003.p
00000440	62 65 72 20 30 38 32 39	51 41 53 30 30 33 0a 70   ber 0829QAS003.p	
00000450	72 6f 64 75 63 74 20 61	73 73 65 74 5f 74 61 67   roduct asset_tag	
00000460	20 4e 55 4c 4c 3a 31 36	0a 63 68 61 73 73 69 73   NULL:16.chassis	
00000470	20 73 65 72 69 61 6c 5f	6e 75 6d 62 65 72 20 30   serial_number 0	
00000480	32 32 36 4c 48 46 2d 30	38 32 32 42 34 30 32 59   226LHF-0822B402Y	
00000490	48 0a 63 68 61 73 73 69	73 20 70 61 72 74 5f 6e   H.chassis part_n	
000004a0	75 6d 62 65 72 20 35 34	30 2d 37 36 31 38 2d 58   umber 540-7618-X	
000004b0	58 0a 5d f3 b7 f3 b7 00	00 00 00 00 00 00 00 00   X.].....	
000004c0	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00   .....	

7. Remove the files you created in the previous steps:

```
# rm /persist(mb.bin /dev/shm/product.info
```

8. Reboot the SP.

A reboot enables the SP to re-read the FRUID data.

## 4.7.3 Changing Product Information on the Motherboard Using a File

1. Once in Escalation mode in ILOM, copy the current product information from the motherboard to a file by issuing this command:

```
frutool -t mb --read_cmm_product_area > /dev/shm/product.info
```

2. Edit the /dev/shm/product.info file to contain the correct serial numbers.

3. Write this file back to the motherboard by issuing this command:

```
frutool -t mb --write_cmm_product_area < /dev/shm/product.info
```

4. Read this file to ensure the changes have been made successfully:

```
frutool -t mb --read_cmm_product_area
```

5. Remove the file you created in the first step of this procedure:

```
# rm /dev/shm/product.info
```

6. Reboot the SP.

A reboot enables the SP to re-read the FRUID data.

## 4.8 Servicing Processors

The following topics are covered:

- [Section 4.8.1, “Processor Fault Remind Button” on page 4-31](#)
- [Section 4.8.2, “Removing a Processor” on page 4-31](#)
- [Section 4.8.3, “Installing a Processor FRU” on page 4-32](#)
- [Section 4.8.4, “Installing an XOption Processor” on page 4-33](#)

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---

See [Section 1.5, “Illustrated Parts Breakdown” on page 1-10](#) for illustrations of the server and processors.

### 4.8.1 Processor Fault Remind Button

If you are replacing a faulty processor, press the Remind button on the motherboard to locate the processor that you want to replace.

The faulty processor LED flashes when the Fault Remind button is pressed and held. All faulty processors are indicated with an amber LED, so that you can install the replacement processor in the same location.

### 4.8.2 Removing a Processor

#### 1. Prepare the server for service.

##### a. Power off the server.

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

##### b. Disconnect the power cord (or cords) from the power supply (or supplies).

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

##### c. Slide the server out of the rack.

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**d. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**e. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**2. Identify which processor to remove.**

Processor 0 is closest to the PSU bay.

**3. Unscrew the two heatsink screws.**

**4. Twist the heatsink slightly to break the seal with grease, and then lift off the heatsink.**

**5. Disengage the lever by pushing down and moving to the side, and then rotating upward.**

**6. Open the pressure frame.**

**7. Remove the processor.**

**8. Place the removed processor in an anti-static package.**

---

**Caution –** Avoid damaging the pins on the processor when placing an old processor in the return package. Use the correct processor package.

---

## 4.8.3 Installing a Processor FRU

To install a processor FRU.

**1. Prepare the server for service.**

**a. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**b. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**c. Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**d. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**e. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**2. Remove the heatsink on top of the failed processor.**

**3. Remove the failed processor.**

**4. Clean off the old thermal interface material from the heatsink and processor, using the supplied alcohol wipe.**

**5. Set the heat sink aside.**

**6. Place the new processor in the socket.**

Make sure the orientation is correct.

**7. Lower the pressure plate.**

Make sure the pressure plate sits flat around the periphery of the processor.

**8. Engage the lever by rotating downward and slipping under the catch.**

**9. Using the supplied grease syringe, empty the syringe on to the processor in a star shaped pattern.**

**10. Smooth the grease into a thin even layer on top of the processor.**

You can use a piece of plastic bag over your finger.

**11. Orient the heatsink so that the two screws line up with the mounting studs.**

**12. Tighten the screws alternately one-half turn until fully seated.**

**13. Return the server to operation.**

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**d. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

## 4.8.4 Installing an XOption Processor

- 1. Prepare the server for service.**
  - a. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - b. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).
  - c. Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).
  - d. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).
  - e. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).
- 2. Remove the shipping cover from socket.**
- 3. Clean the top of the processor with the provided alcohol wipe.**
- 4. Place the processor in the socket with the correct orientation.**
- 5. Lower the pressure plate.**

Make sure the pressure plate sits flat around the periphery of the processor.
- 6. Engage the lever by rotating downward and slipping under the catch.**
- 7. Remove the plastic protective cover from heatsink.**

Be careful not to disturb or touch the pre-installed thermal interface material.
- 8. Orient the heatsink so the two screws line up with the mounting studs.**
- 9. Tighten the screws alternately one 1/2 turn until fully seated.**
- 10. Return the server to operation.**
  - a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).
  - b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**d. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

---

## 4.9

# Resetting Passwords and Clearing CMOS NVRAM

The following topics are covered:

- [Section 4.9.1, “Overview” on page 4-35](#)
- [Section 4.9.2, “Resetting a BIOS Password From the BIOS Screen” on page 4-35](#)
- [Section 4.9.3, “Resetting CMOS NVRAM Using a Jumper” on page 4-36](#)

### 4.9.1

## Overview

You can reset a password from the BIOS screen or with a jumper. You can also clear the NVRAM or BIOS Password by changing the J1802 jumper position as follows.

J1802 jumper position 1-3: Clears CMOS NVRAM

J1802 jumper position 2-4: Clears the password

Access the J1802 jumper on the motherboard in the rear, on the opposite side of the power supply unit.

### 4.9.2

## Resetting a BIOS Password From the BIOS Screen

---

**Note –** Reset of any password on the security BIOS screen resets the BIOS password only, not the ILOM password.

---

To reset a password for the BIOS, access the BIOS Security screen.

**1. Boot the server.**

**2. Press F2 at the Sun splash screen to enter Setup.**

- 3. At the BIOS screen, move to the Security Screen tab.**
  - 4. Change the password.**
  - 5. Save and Exit the BIOS.**
- The system restarts.

### 4.9.3 Resetting CMOS NVRAM Using a Jumper

To clear the CMOS NVRAM using a jumper:

**1. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**2. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**3. Extend the server into the maintenance position.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**4. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**5. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**6. Locate the jumper J1802**

The jumper is on the rear of the motherboard, opposite side of the power supply.

**7. Place the jumper on position 1-3.**

**8. Power on the server and boot until message about NVRAM has been cleared.**

**9. Power off the server, and remove AC power.**

**10. Remove jumper from position 1-3, and replace it back in its original location.**

**11. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**12. Slide the server into the rack.**

See [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#).

**13. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

**14. Power on the server.**

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

CMOS NVRAM is cleared.

---

## 4.10 Recovering From Corrupt Service Processor Software

If the SP (service processor) software becomes corrupted, you can reinstall the default SP software image from the Tools and Drivers CD.

You need the following:

- Tools and Drivers CD.
- Bootable USB flash device.

### 4.10.1 Reinstalling The Default SP Software Image From The Tools And Drivers CD

This emergency flash recovery procedure returns the SP to a default configuration.

The ILOM SPBIOS <file-name>.pkg file format (for example ilom.X4150-2.0.2.6.pkg) cannot be used for emergency recovery. Use the <file-name>.bin recovery image instead.

**1. Copy the following SP files from the Tools and Drivers CD, located in the recovery directory, to a USB bootable flash device.**

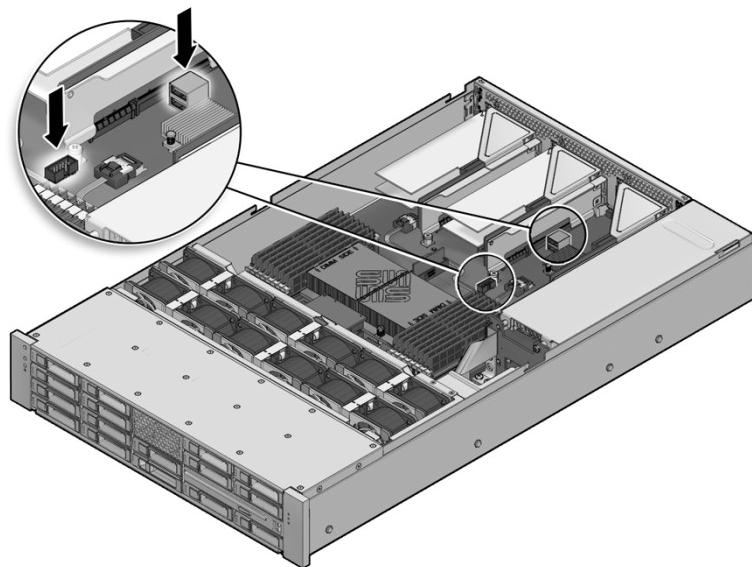
- SOCFLASH.EXE
- DOS4GW
- BMC Binary (the SP Binary file)

**2. Insert the bootable flash drive into the USB port.**

- a. Press F8 to get a list of the boot devices.

- b. Choose the USB flash boot device.  
or
  - a. Press F2 to enter the BIOS setup screen.
- b. Choose the USB flash device as the first boot device.
- c. Save and exit.

FIGURE 4-15



3. Once the flash device is booted, run the following command:

```
socflash -p 1 -f <sp-binary-file>
```

For Example:

```
socflash -p 1 -f g12n.bin
```

If you want to back up the current flash content, run following command:

```
socflash -p 1 -f <sp-binary-file> -b <backup-binary-file>
```

For example:

```
socflash -p 1 -f g12n.bin -b ilombak.bin
```

---

**Note –** If you choose to back up the SP binary (**-b <backup-filename>**), you must ensure there is sufficient free space on the USB flash device to hold the backup file.

---

---

**Note** – Use the command **socflash -h** to get a complete option listing.

---

4. After a successful flash, perform an AC power cycle or reset the SP using the following command:

**socflash -r**

---

**Note** – Using **-r** (resetting the SP hardware) can cause the VGA display to become disrupted.

---

---

**Note** – The BIOS is not upgraded by this emergency recovery procedure. Perform a 2nd ILOM-based flash upgrade, to update the BIOS version.

---

---

**Note** – This emergency flash recovery procedure returns the SP to default configuration.

---

5. Press F2 to enter system BIOS and verify that the flash device is in the boot order.
6. After a successful flash, remove the flash drive from the USB port.
7. AC power cycle the server.  
Wait at least 2 minutes to let SP come up first.
8. Power on the server and enter BIOS.
9. Confirm following items are correct in BIOS:
  - a. BMC Firmware Revision is correct on the Main page.
  - b. Status of BMC is working in Advanced -> IPMI 2.0 Configuration page.
10. Exit BIOS and start the operating system.

---

## 4.11 Using the Reset and NMI Switches



---

**Caution** – Do not use the Reset and NMI Dump switches unless you are instructed to do so by a Field Service engineer.

---

## 4.11.1 Reset Switch

The Reset switch (SW2 on the motherboard) sends a reset order to the processors, resetting the main system, but not the service processor. The button for this switch can be pushed by sticking a paper clip or similar object through the hole provided on the rear of the chassis.

## 4.11.2 NMI Dump Switch

The NMI button is the center button of the row of 3 hidden (recessed) buttons on the back of the motherboard. The button for this switch can be pushed by sticking a paper clip or similar object through the hole provided on the rear of the chassis.

The Non-Maskable Interrupt (NMI) Dump switch sends an NMI order to the processors, which is used by Field Service for debugging activities at the request of operating system engineers. NMI can also be asserted by ILOM. Refer to the *Sun Integrated Lights Out Manager User's Guide*.



# Servicing Infrastructure Boards and Components

---

This chapter describes how to replace cold-swappable, field-replaceable units (FRUs) in the Sun Fire X4140 Server.

The following topics are covered:

- [Section 5.1, “Servicing the DVD/USB Module” on page 5-2](#) (CRU)
- [Section 5.2, “Servicing the Fan Power Boards” on page 5-4](#) (FRU)
- [Section 5.3, “Servicing the Drives Cage” on page 5-7](#) (FRU)
- [Section 5.4, “Servicing the Drives Backplane” on page 5-11](#) (FRU)
- [Section 5.5, “Servicing the Front Control Panel Light Pipe Assembly” on page 5-13](#) (FRU)
- [Section 5.6, “Servicing the Power Distribution Board \(PDB\)” on page 5-15](#) (FRU)
- [Section 5.7, “Servicing the Paddle Card” on page 5-17](#) (FRU)
- [Section 5.8, “Servicing Cables” on page 5-19](#) (FRU)



**Caution** – Never attempt to run the server with the covers removed. Hazardous voltage present.

---



**Caution** – Equipment damage possible. The covers must be in place for proper air flow.

---

## 5.1

# Servicing the DVD/USB Module

The DVD-ROM drive and front USB board are mounted in a removable module that is accessible from the front panel of the system. The DVD/USB module must be removed from the drive cage to service the drives backplane.

---

**Note – CRU:** This customer-replaceable unit can be replaced by anyone.

---

### 5.1.1

## Removing the DVD/USB Module

- 1. Remove media from the drive.**

- 2. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

- 3. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

- 4. Remove the Sun Fire X4140 Server HDD7 hard drive.**

See [“Server Front Panel” on page 3-3](#) for drives locations.

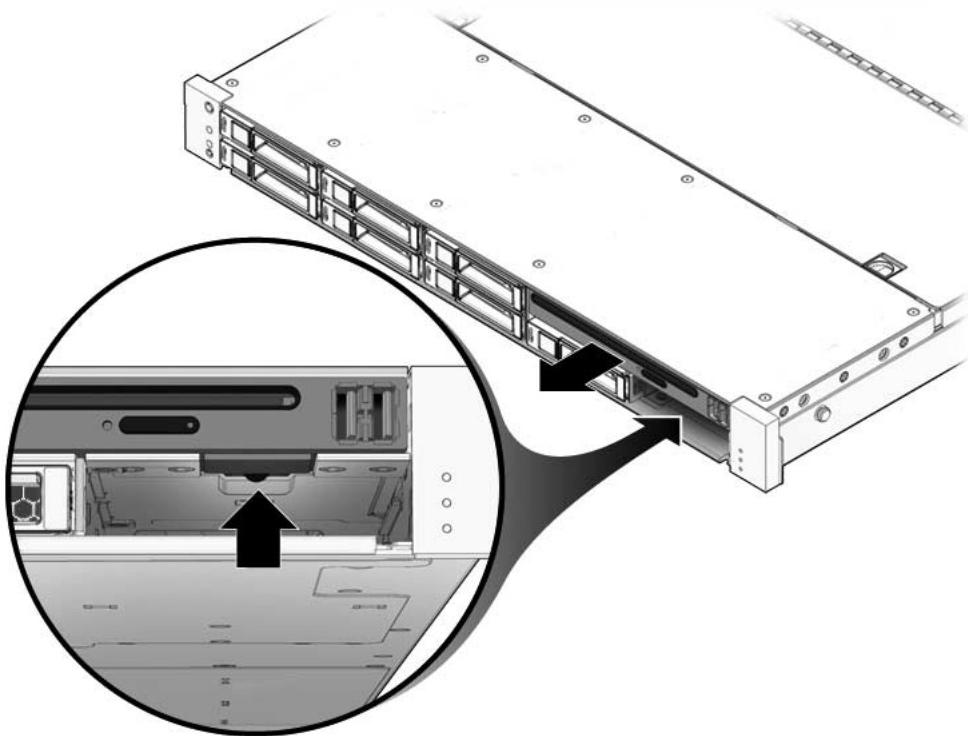
- 5. Release the DVD/USB module from the drives backplane ([FIGURE 5-1](#)).**

Use the finger indent in the drive bay below the DVD/USB module to detach the module from the backplane.

- 6. Slide the DVD/USB module out of the drive cage.**

- 7. Place the module on an antistatic mat.**

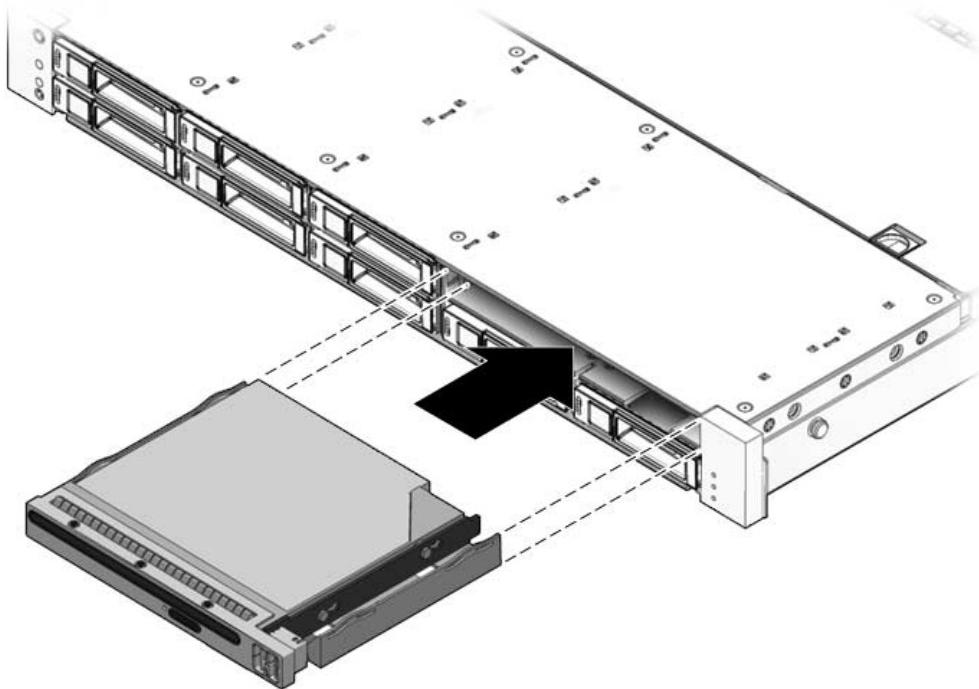
**FIGURE 5-1** Removing the DVD/USB Module



### 5.1.2 Installing the DVD/USB Module

1. **Slide the DVD/USB module into the front of the chassis until it seats (FIGURE 5-2).**
2. **Install the drive you removed during the DVD/USB module removal procedure.**  
See [Section 3.2.5, “Installing a Hard Drive or SSD” on page 3-7](#) for information about installing a drive.
3. **Power on the server.**  
See [Section 6.4, “Powering On the Server” on page 6-5](#).

**FIGURE 5-2** Installing the DVD/USB Module



## 5.2

## Servicing the Fan Power Boards

You must remove both fan power boards to access the paddle card or to access the drives data cables in the Sun Fire X4140 Server.

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---



---

**Caution –** Ensure that all power is removed from the server before removing or installing fan power boards. You must disconnect the power cables before performing this procedure.

---

## 5.2.1 Removing a Fan Power Board

### 1. Prepare the server for service.

#### a. Power off the server.

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### b. Disconnect the power cord (or cords) from the power supply (or supplies).

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

#### c. Slide the server out of the rack.

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

---

**Note –** If you are removing the fan power boards to access the paddle card or drive cage, you must remove the server from the rack. See [Section 2.6, “Removing a Server From the Rack” on page 2-7](#).

---

#### d. Attach an antistatic wrist strap.

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

#### e. Remove the top cover.

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

### 2. Remove the fan modules.

---

**Note –** If you are replacing a defective fan power board, remove only the fan modules that are necessary to remove the defective fan power board.

---

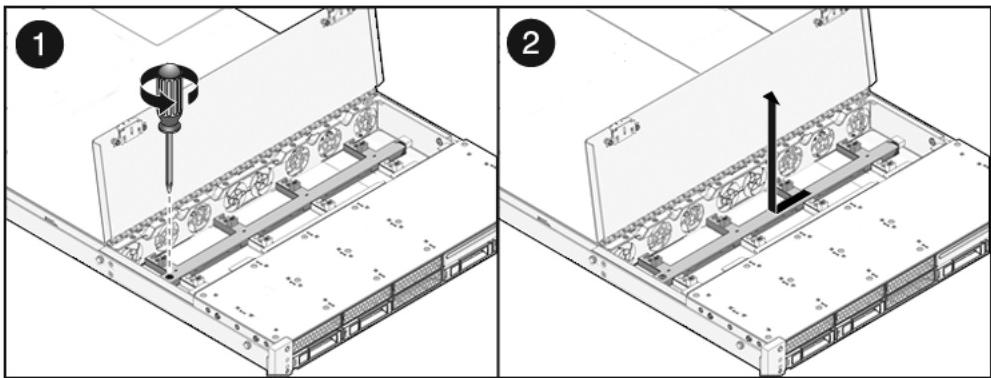
See [Section 3.3.4, “Removing a Fan Module” on page 3-11](#).

### 3. Remove the Phillips screw that secures the fan power board to the chassis ([FIGURE 5-3](#)).

### 4. Slide the fan power board to the left to disengage it from the paddle card.

### 5. Remove the fan power board from the system and place it on an antistatic mat.

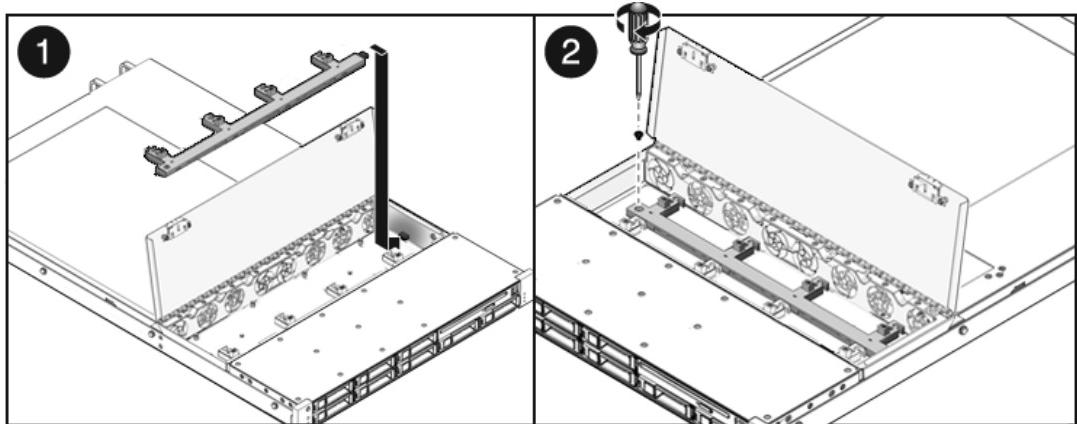
**FIGURE 5-3** Removing a Fan Power Board



## 5.2.2 Installing a Fan Power Board

1. Lower the board into its mushroom standoffs in the chassis floor and slide the board to the right into the paddle card ([FIGURE 5-4](#)).

**FIGURE 5-4** Installing a Fan Power Board



2. Secure the board to the chassis with a Phillips screw.
3. Reinstall the fan modules.  
See [Section 3.3.5, “Installing a Fan Module”](#) on page 3-12.
4. Return the server to operation.

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**b. Slide the server into the rack.**

See [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#).

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**d. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

---

## 5.3

## Servicing the Drives Cage

You must remove the drive cage to access the following components:

- Drives backplane
- Front control panel light pipe assemblies

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---



---

**Caution –** Ensure that all power is removed from the server before removing or installing the drives cage. You must disconnect the power cables before performing this procedure.

---

### 5.3.1

### Removing the Drives Cage

**1. Prepare the server for service.**

**a. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**b. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**c. Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**d. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**e. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**2. If you are servicing the drives backplane, remove all drives.**

See [Section 3.2.4, “Removing a Hard Drive or SSD” on page 3-5](#).

---

**Note –** Make a note of the drive locations before removing them from the system. You will need to install the drives in the correct locations when reassembling the system.

---

**3. If you are servicing the drive backplane, remove the DVD/USB module.**

See [Section 5.1.1, “Removing the DVD/USB Module” on page 5-2](#).

**4. Remove the fan modules.**

See [Section 3.3.4, “Removing a Fan Module” on page 3-11](#).

**5. Remove the No. 2 Phillips screws securing the drives cage to the chassis (FIGURE 5-5 [1] and [2]).**

Two screws secure the disk cage to each side of the chassis.

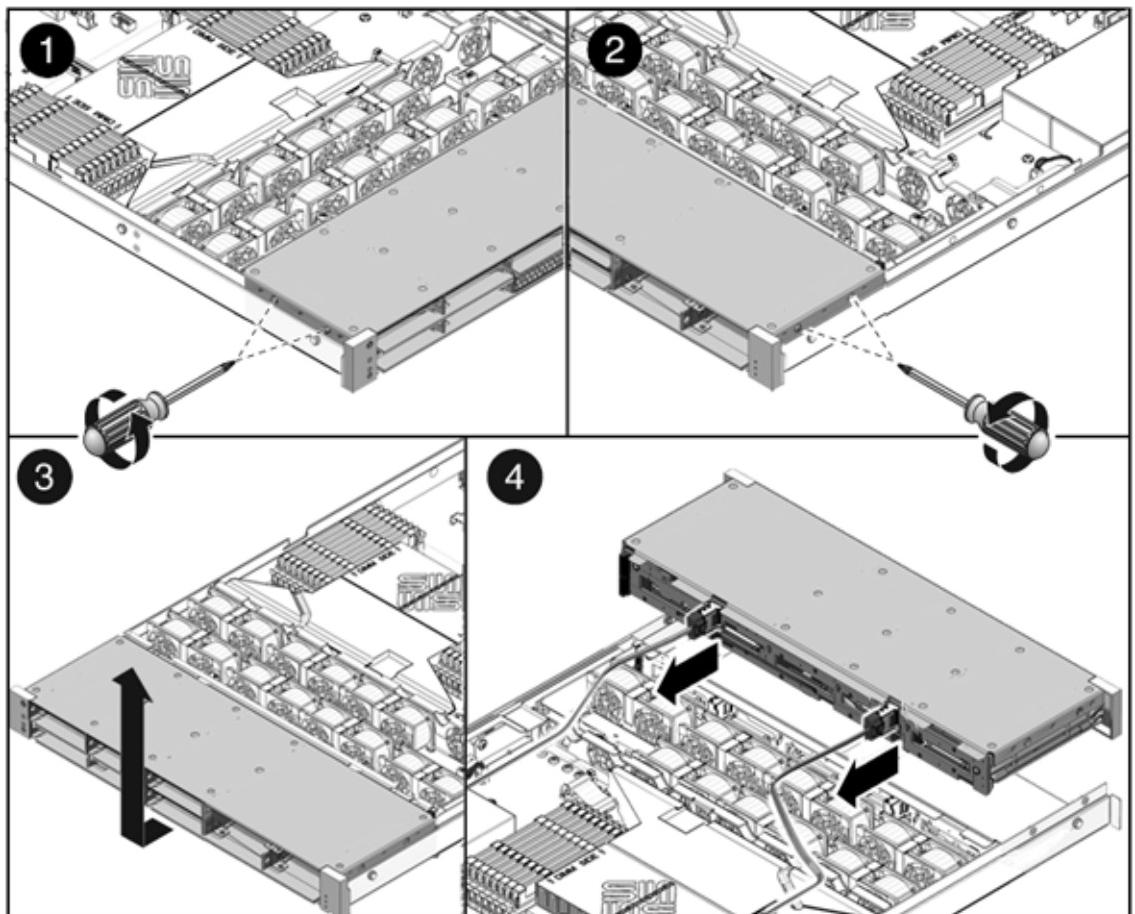
**6. Slide the drives cage forward to disengage the backplane from the paddle cards (FIGURE 5-5 [3]).**

**7. Lift the drives cage up and disconnect the drives data cables (FIGURE 5-5 [4]).**

Press the connector release button to release the cable.

**8. Set the drives cage on an antistatic mat.**

**FIGURE 5-5** Removing the Drives Cage



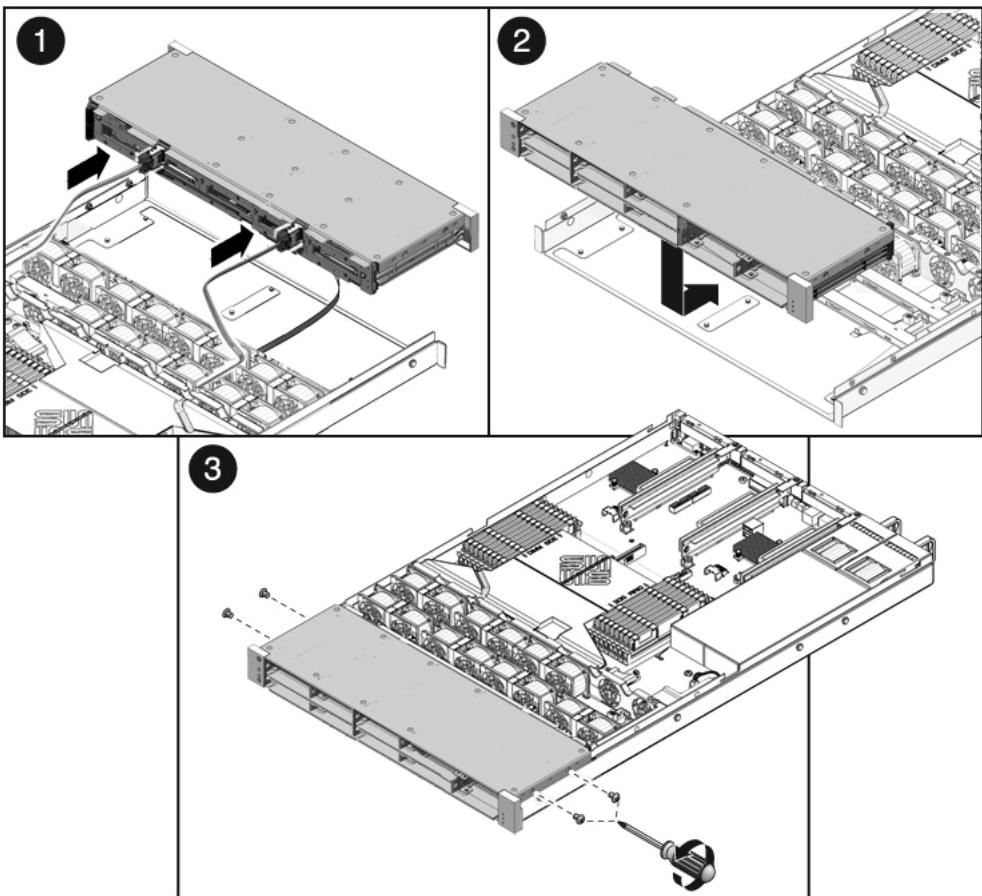
### 5.3.2 Installing the Drives Cage

- 1. Connect the drives data cables.**

Press the connector into its socket until it snaps into place.

- 2. Position the drives cage in the chassis, over its standoffs (FIGURE 5-6 [1]).**

**FIGURE 5-6** Installing the Drives Cage



3. Slide the drives cage back until the drives backplane engages with the paddle card connector ([FIGURE 5-6 \[2\]](#)).

4. Replace the No. 2 Phillips screws securing the drives cage to the chassis ([FIGURE 5-6 \[3\]](#)).

Two screws secure the disk cage to each side of the chassis.

5. **Install the fan power boards.**

See [Section 5.2.2, “Installing a Fan Power Board” on page 5-6](#).

6. **Install the fan modules.**

See [Section 3.3.5, “Installing a Fan Module” on page 3-12](#).

**7. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**8. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

**9. Install the drives.**

---

**Note –** Ensure you are installing the drives in the correct drive bays.

---

See [Section 3.2.5, “Installing a Hard Drive or SSD” on page 3-7](#).

**10. Install the DVD/USB module.**

See [Section 5.1.2, “Installing the DVD/USB Module” on page 5-3](#).

**11. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**12. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

---

## 5.4

## Servicing the Drives Backplane

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---

### 5.4.1

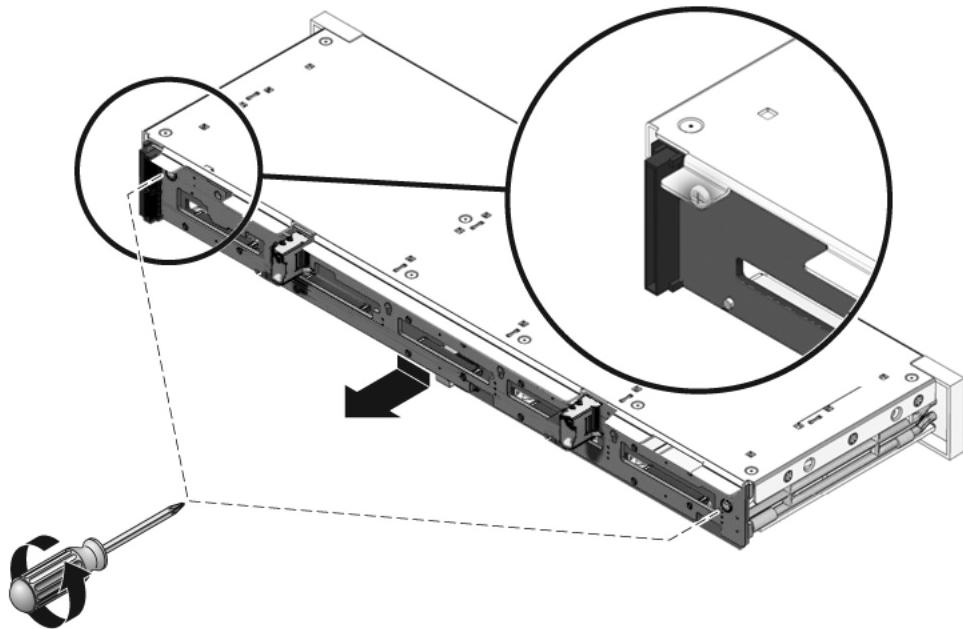
### Removing the Drives Backplane

**1. Remove the drives cage.**

See [Section 5.3.1, “Removing the Drives Cage” on page 5-7](#).

**2. Remove the two No. 2 Phillips screws securing the backplane to the drives cage (FIGURE 5-7).**

**FIGURE 5-7** Removing the Drives Backplane



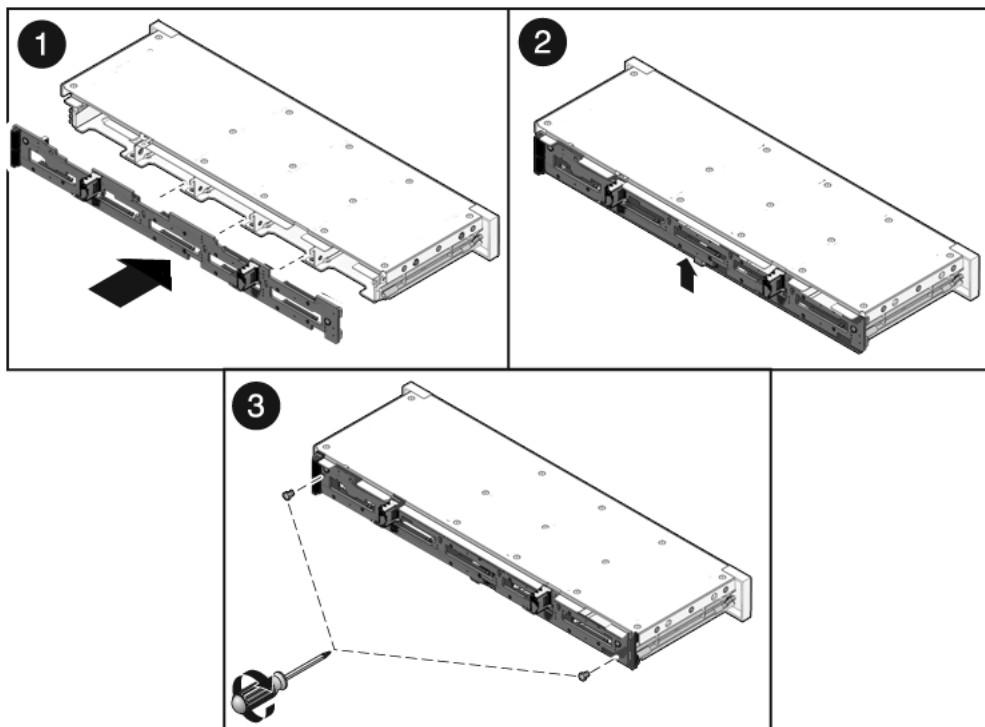
3. Slide the backplane down and off the drives cage retention hooks.
4. Place the drives backplane on an antistatic mat.

## 5.4.2 Installing the Drives Backplane

1. Slide the backplane under the retention hooks on the drives cage ([FIGURE 5-8](#)).
2. Install the two No. 2 Phillips screws that secure the backplane to the drives cage.
3. Install the drives cage.

See [Section 5.3.2, “Installing the Drives Cage”](#) on page 5-9.

**FIGURE 5-8** Installing the Drives Backplane



---

## 5.5 Servicing the Front Control Panel Light Pipe Assembly

You must remove the drives backplane to service the front control panel light pipe assemblies.

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---

## 5.5.1 Removing the Front Control Panel Light Pipe Assembly

1. Remove the drives cage.

See [Section 5.3.1, “Removing the Drives Cage” on page 5-7](#).

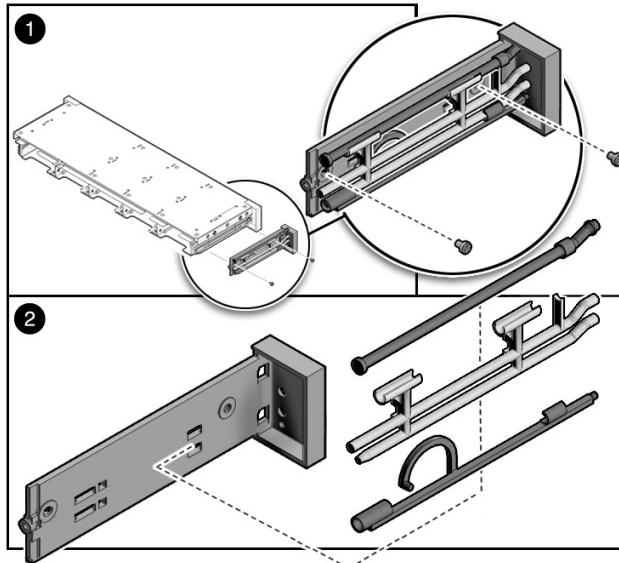
2. Remove the drives backplane.

See [Section 5.4.1, “Removing the Drives Backplane” on page 5-11](#).

3. Remove the two No. 2 Phillips screws securing the front control panel light pipe assembly to the drives cage ([FIGURE 5-9](#)).

4. Slide the light pipe assembly out of the drives cage.

**FIGURE 5-9** Removing the Light Pipe Assembly



## 5.5.2 Installing the Front Control Panel Light Pipe Assembly

For replacement, ensure the board is aligned and Caution light pipes are exposed. Pay close attention when inserting the assembly.

1. Align the light pipe assembly with the mounting holes on the drives cage.

2. Secure the light pipe assembly with two No. 2 Phillips screws.

3. Install the drives backplane.

See [Section 5.4.2, “Installing the Drives Backplane” on page 5-12](#).

4. Install the drives cage.

See [Section 5.3.2, “Installing the Drives Cage” on page 5-9](#).

---

## 5.6

# Servicing the Power Distribution Board (PDB)

It is easier to service the power distribution board (PDB) with the bus bar assembly attached. If you are replacing a faulty PDB, you must remove the bus bar assembly from the old board and attach it to the new PDB.

You must remove the power distribution board to access the paddle card.

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---



---

**Caution –** The system supplies power to the power distribution board even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the power distribution board.

---

## 5.6.1

### Removing the Power Distribution Board

1. Remove the motherboard assembly.

See [Section 4.6.1, “Removing the Motherboard Assembly” on page 4-22](#).

2. Remove all power supplies.

a. Grasp the power supply handle and press the release latch.

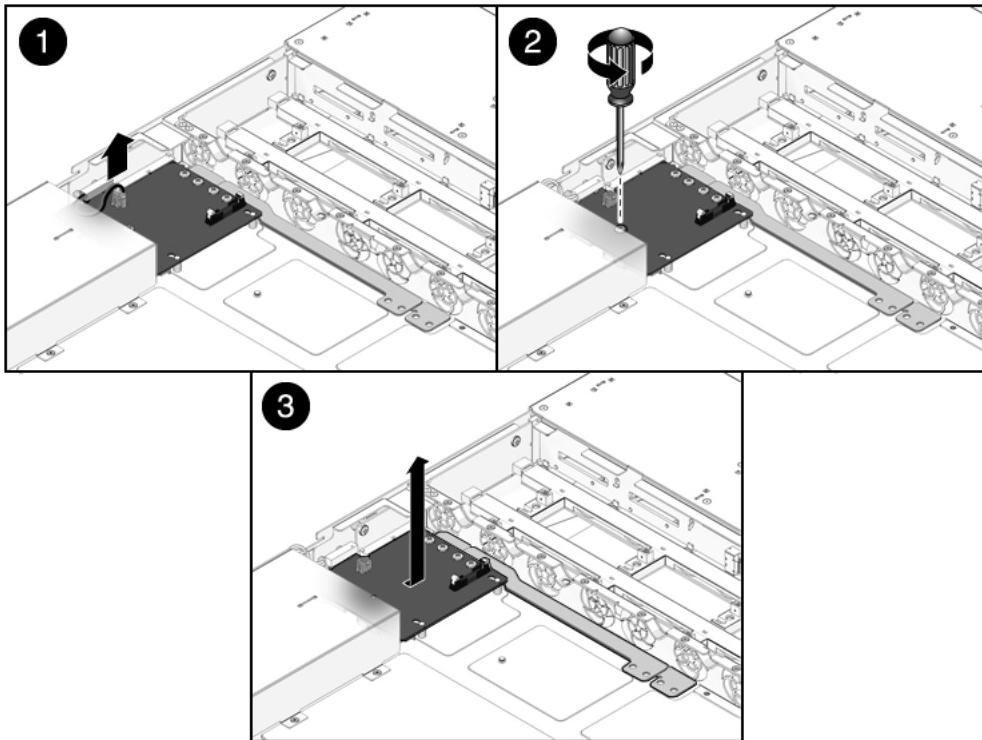
b. Slide the power supply out of the system.

See [Section 3.4.3, “Removing a Power Supply” on page 3-15](#).

3. Disconnect the top cover interlock cable from the power distribution board ([FIGURE 5-10](#)).

4. Remove the No. 2 Phillips screw securing the PDB to the chassis.
5. Grasp the bus bar and pull the PDB/bus bar assembly to the left, away from the paddle card.
6. Lift the PDB/bus bar assembly up and out of the system.
7. Place the PDB/bus bar assembly on an antistatic mat.

**FIGURE 5-10** Removing the Power Distribution Board

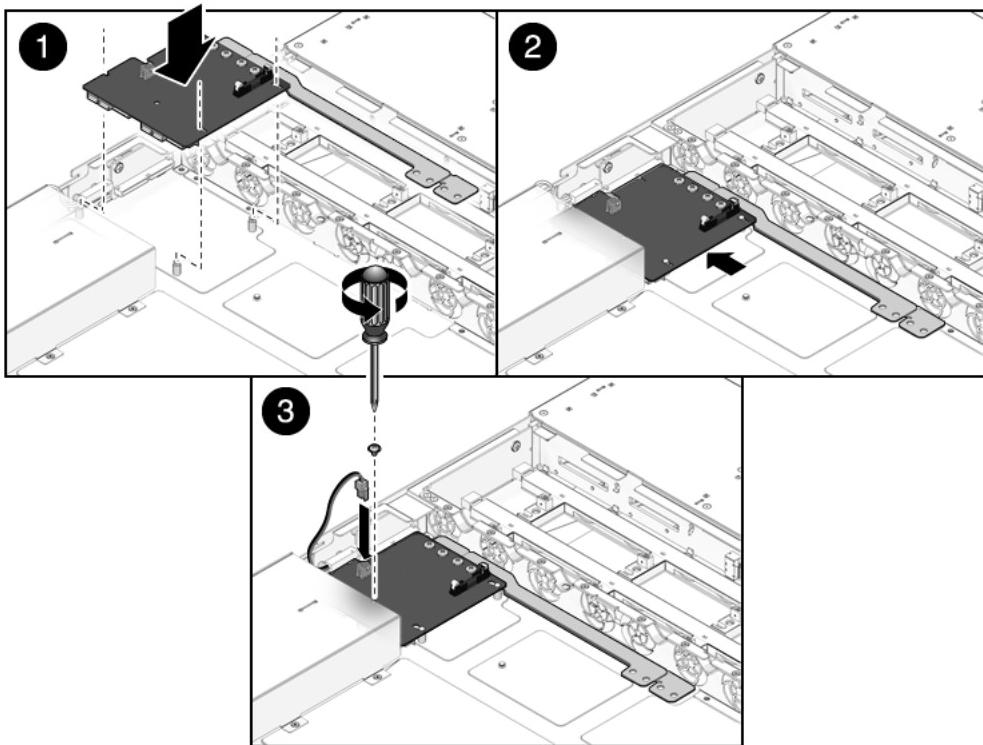


## 5.6.2 Installing the Power Distribution Board

1. Lower the PDB/bus bar assembly into the chassis ([FIGURE 5-11](#)).  
The PDB fits over a series of mushroom standoffs in the floor of the chassis.
2. Slide the PDB/bus bar assembly to the right, until it plugs into the paddle card.
3. Install the No. 2 Phillips screw to secure the PDB to the chassis.

**4. Connect the top cover interlock cable to the power distribution board.**

**FIGURE 5-11** Installing the Power Distribution Board



**5. Install the power supplies.**

Slide each power supply into its bay until it locks into place.

See [Section 3.4.4, “Installing a Power Supply” on page 3-17](#).

**6. Install the motherboard assembly.**

See [Section 4.6.2, “Installing the Motherboard Assembly” on page 4-24](#).

---

## 5.7 Servicing the Paddle Card

The paddle card assembly includes the top cover interlock switch.

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---

## 5.7.1 Removing the Paddle Card

1. Remove the motherboard assembly.

See [Section 4.6.1, “Removing the Motherboard Assembly” on page 4-22](#).

2. Remove the power distribution board.

See [Section 5.6.1, “Removing the Power Distribution Board” on page 5-15](#).

3. Remove the fan power boards.

See [Section 5.2.1, “Removing a Fan Power Board” on page 5-5](#).

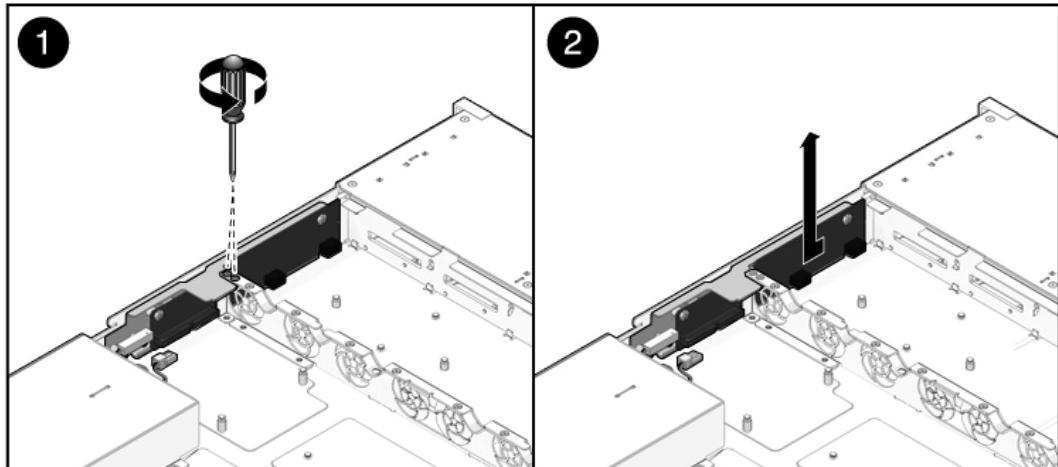
4. Remove the two No. 2 Phillips screws securing the paddle card to the chassis ([FIGURE 5-12](#)).

5. Slide the paddle card back, away from its connector on the drives backplane.

6. Lift the paddle card up and out of the chassis.

7. Place the paddle card on an antistatic mat.

**FIGURE 5-12** Removing the Paddle Card



## 5.7.2 Installing the Paddle Card

1. Lower the paddle card into the chassis.

The paddle card fits over a series of mushroom standoffs in the chassis side wall.

2. Slide the paddle card forward to plug it into the drives backplane. ([FIGURE 5-13](#)).

3. Secure the paddle card with two No. 2 Phillips screws.

4. Install the fan power boards.

See [Section 5.2.2, “Installing a Fan Power Board” on page 5-6](#).

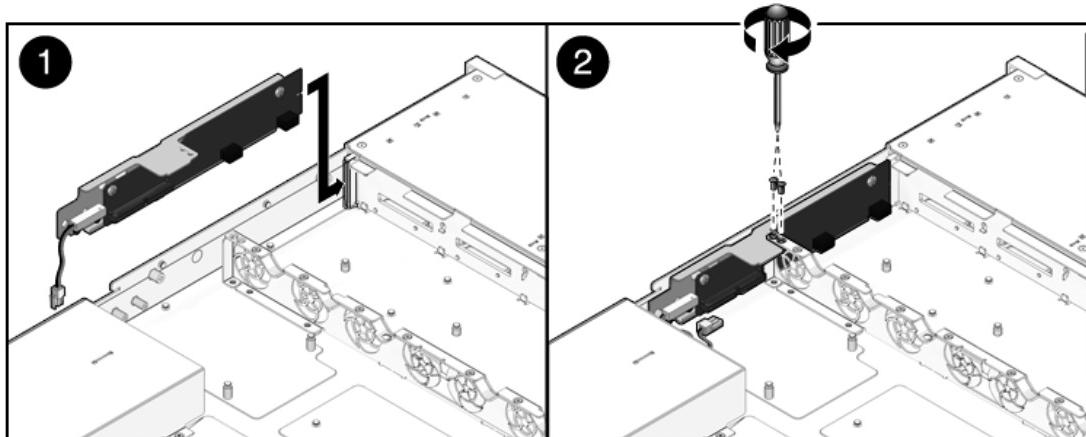
5. Install the power distribution board.

See [Section 5.6.2, “Installing the Power Distribution Board” on page 5-16](#).

6. Install the motherboard assembly.

See [Section 4.6.2, “Installing the Motherboard Assembly” on page 4-24](#).

**FIGURE 5-13** Installing the Paddle Card



## 5.8 Servicing Cables

The following topics are covered:

- [Section 5.8.1, “Removing HDD Cables in a SAS Configuration” on page 5-20](#)
- [Section 5.8.2, “Installing HDD Cables in a SAS Configuration” on page 5-21](#)
- [Section 5.8.3, “Removing HDD Cables in a SATA Configuration” on page 5-22](#)

- Section 5.8.3, “Removing HDD Cables in a SATA Configuration” on page 5-22
- Section 5.8.5, “Removing a PDB Cable” on page 5-24
- Section 5.8.6, “Installing a PDB Cable” on page 5-25

See [Section 1.5, “Illustrated Parts Breakdown” on page 1-10](#) for illustrations of cables.

---

**Note – FRU:** This field-replaceable unit should be replaced only by qualified service technicians. Contact your Sun Service representative for assistance.

---

## 5.8.1 Removing HDD Cables in a SAS Configuration

To remove Hard Disk Drive cables in a SAS configuration.

**1. Prepare the server for service.**

**a. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**b. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**c. Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**d. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**e. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**2. Untwist the cable tiedowns to release the cables.**

**3. Remove the cables from the HBA PCIe card by pressing down on the latch and then pulling out the connector.**

The HBA card is located in PCIe slot 1.

**4. Remove the fans from fan board 0.**

**5. Disconnect each cable at the Hard Disk Drive backplane by pressing down on the latch and then pulling out the connector.**

**6. Remove the cables.**

Do not snag the cables on the retainer above the midwall.

## 5.8.2

## Installing HDD Cables in a SAS Configuration

To install two Hard Disk Drive cables; Disk 0-3 and Disk 4-7 in a SAS configuration, do the following.

**1. Install the disk 0-3 cable first.**

**a. Install the right angle connector in the Hard Disk Drive backplane.**

The connector is on the left from the front of the unit.

**b. Route the cable down and in front of fan board 0, to prevent the cable from blocking the air stream.**

Lay the cable through the opening in the midwall, opposite the other disk backplane connector.

**c. Plug the connector into the connector on the HBA card that is closest to the gold fingers (port 0).**

**2. Install the disk 4-7 cable.**

**a. Plug the backplane connector into the Hard Disk Drive backplane.**

**b. Route the cable over the Disk 0-3 cable in the same channel through the midwall.**

**c. Plug the connector into the connector on the HBA card that is furthest from the gold fingers (port 1).**

**3. Dress the cables in the cable tie downs, and then secure the cable tie downs.**

**4. Reinstall the fans to fan board 0.**

**5. Return the server to operation.**

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

**d. Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

## 5.8.3 Removing HDD Cables in a SATA Configuration

To remove Hard Disk Drive cables in a SATA configuration.

**1. Prepare the server for service.**

**a. Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**b. Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

**c. Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

**d. Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

**e. Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

**2. (Optional) Remove the card in the PCIe 0 riser for better access.**

**3. Untwist the cable tiedowns to release the cables.**

**4. Press the latch on the single headed cable and then disconnect the cable from the motherboard.**

**5. Pull up on each of the three individual connectors on the other cable.**

**6. Remove the fans from fan board 0.**

**7. Disconnect each cable at Hard Disk Drive backplane by pressing down on the latch and then pulling out the connector.**

**8. Remove the cables.**

Do not snag the cables on the retainer above the mid-wall.

## 5.8.4 Installing HDD Cables in a SATA Configuration

To install two Hard Disk Drive cables, Disk 0-3 and Disk 4-5 in SATA configuration, do the following.

**1. Install the disk 0-3 cable.**

**a. Install the connector in the Hard Disk Drive backplane.**

The connector is on the left from the front of the server.

**b. Route the cable down in front of fan board 0 to prevent it from blocking the air stream.**

Lay it through the opening in the midwall opposite the other disk backplane connector.

**c. Plug the connector into the connector on the motherboard.**

**2. Install the disk 4-5 cable.**

**a. Plug the backplane connector into the Hard Disk Drive backplane.**

**b. Route the cable over the Disk 0-3 cable in the same channel through the midwall.**

**c. Plug the connectors into the three connectors on the motherboard**

The connector labeled 4 plugs into the connector labeled SATA4.

The connector labeled 5 plugs into the connector labeled SATA5.

The unlabeled rectangular connector plugs into the connector directly behind the two SATA connections.

---

**Note** – Note the key direction before plugging in this connector.

---

**3. Dress the cables in the cable tie downs, and then secure the cable tie downs.**

**4. Reinstall the fans to fan board 0.**

**5. Return the server to operation.**

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover” on page 6-2](#).

**b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#).

- c. **Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server” on page 6-5](#).

- d. **Power on the server.**

See [Section 6.4, “Powering On the Server” on page 6-5](#).

## 5.8.5

## Removing a PDB Cable

To remove a Power Distribution Board cable.

### 1. Prepare the server for service.

- a. **Power off the server.**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

- b. **Disconnect the power cord (or cords) from the power supply (or supplies).**

See [Section 2.4, “Powering Off the Server” on page 2-4](#).

- c. **Slide the server out of the rack.**

See [Section 2.5, “Extending the Server to the Maintenance Position” on page 2-5](#).

- d. **Attach an antistatic wrist strap.**

See [Section 2.7, “Performing Electrostatic Discharge and Antistatic Prevention Measures” on page 2-9](#).

- e. **Remove the top cover.**

See [Section 2.8, “Removing the Top Cover” on page 2-11](#).

### 2. Remove the PDB end of the cable.

- a. **Release the latches on either side and then pull the cable straight up.**

- b. **Grasp each end of the connector on the motherboard, and then pull straight up to disconnect from connector.**

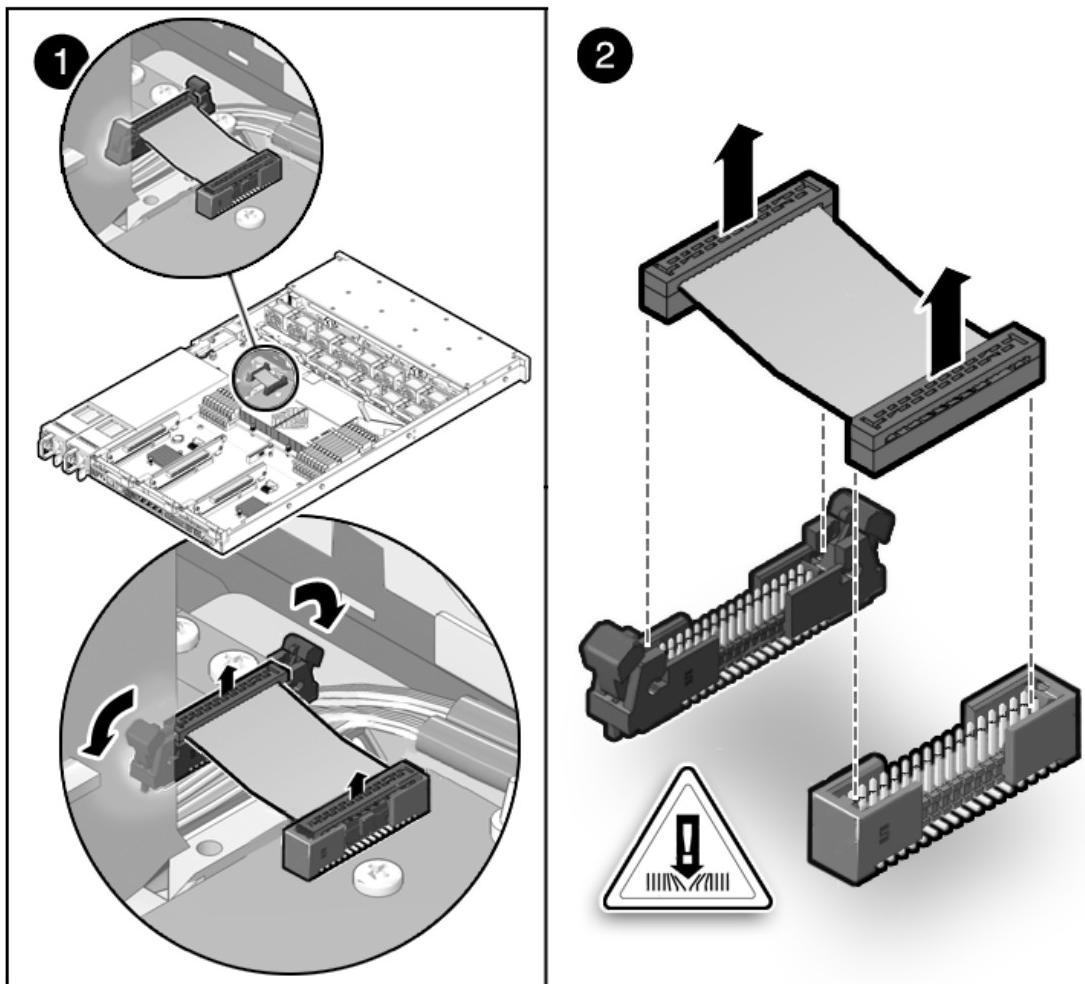


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**Caution –** Do not bend the pins on the unshrouded motherboard connector.

---

**FIGURE 5-14** Removing the PDB Cable



## 5.8.6 Installing a PDB Cable

To install a Power Distribution Board cable.

1. Remove the PDB cable.
2. Inspect the motherboard pin field to ensure that all pins are straight.

**3. Open the latches on the PDB connector.**

Ensure that the key of the cable lines up with the slot on the connector.

**4. Push the cable connector into the PDB connection until seated.**

The latches should be above the connector housing.

**5. Carefully align the motherboard connector to the motherboard pin field.**

Gently press the connector down until seated. If you feel significant resistance, stop and check the pin alignment.

**6. Return the server to operation.**

**a. Install the top cover.**

See [Section 6.1, “Installing the Top Cover”](#) on page 6-2.

**b. Install the server into the rack.**

See [Section 6.2, “Reinstalling the Server in the Rack”](#) on page 6-3.

**c. Reconnect the power cord (or cords) to the power supply (or supplies).**

Verify that the AC Present LED is lit.

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

**d. Power on the server.**

See [Section 6.4, “Powering On the Server”](#) on page 6-5.

# Returning the Server to Operation

---

This chapter describes how to return the Sun Fire X4140 Server to operation after you have performed service procedures.

The following topics are covered in this chapter:

- [Section 6.1, “Installing the Top Cover” on page 6-2](#)
- [Section 6.2, “Reinstalling the Server in the Rack” on page 6-3](#)
- [Section 6.3, “Returning the Server to the Normal Rack Position” on page 6-4](#)
- [Section 6.4, “Powering On the Server” on page 6-5](#)



**Caution** – Never attempt to run the server with the covers removed. Hazardous voltage present.

---



**Caution** – Equipment damage possible. Covers must be in place for proper air flow.

---

## 6.1 Installing the Top Cover

If you removed the top cover, perform the following steps to replace it:

**1. Place the top cover on the chassis.**

Set the cover down so that it hangs over the rear of the server by about an inch (25.4 mm).

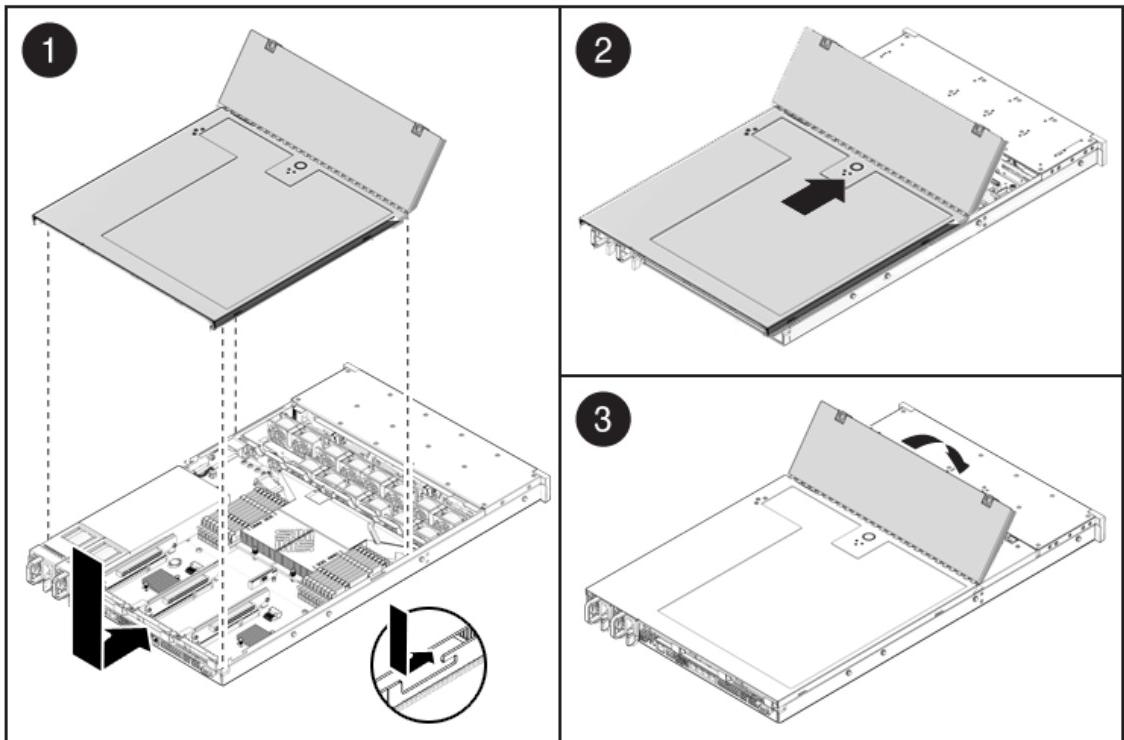
**2. Slide the top cover forward until it seats ([FIGURE 6-1](#)).**

**3. Close the fan cover.**



**Caution** – If the top cover is not installed correctly, and the cover is not completely closed, the server will not power on.

**FIGURE 6-1** Installing the Top Cover



## 6.2

# Reinstalling the Server in the Rack

If you removed the server chassis from the rack, perform these steps.



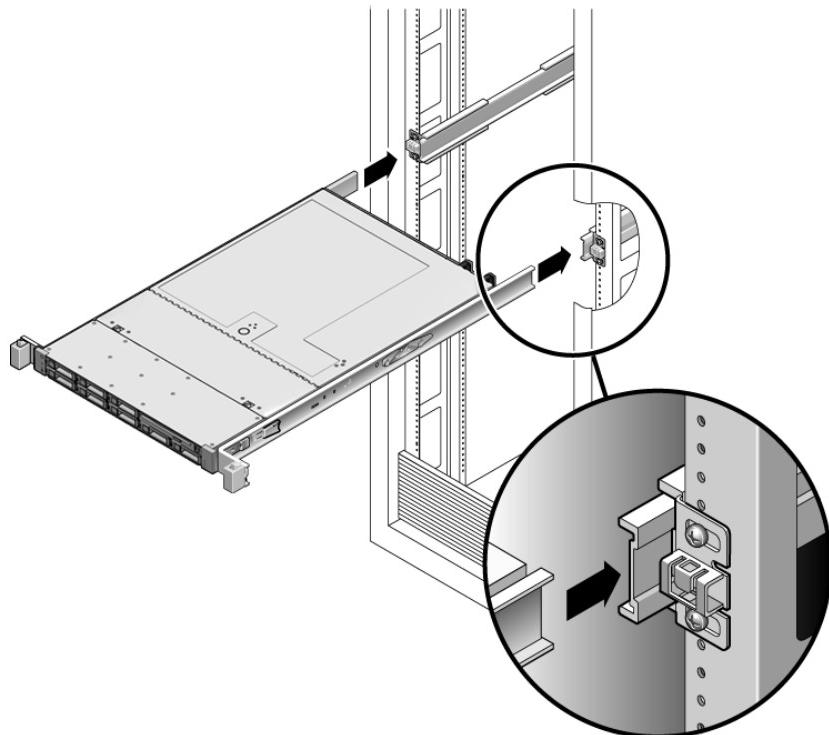
**Caution –** The servers are heavy. Two people might be required to carry the chassis and install it in the rack.



1. On the rack, ensure that the slide rails are extended.
2. Place the ends of the chassis mounting brackets into the slide rails ([FIGURE 6-2](#)).
3. Slide the server into the rack until the brackets lock into place.

The server is now in the extended maintenance position.

**FIGURE 6-2** Returning the Server to the Rack

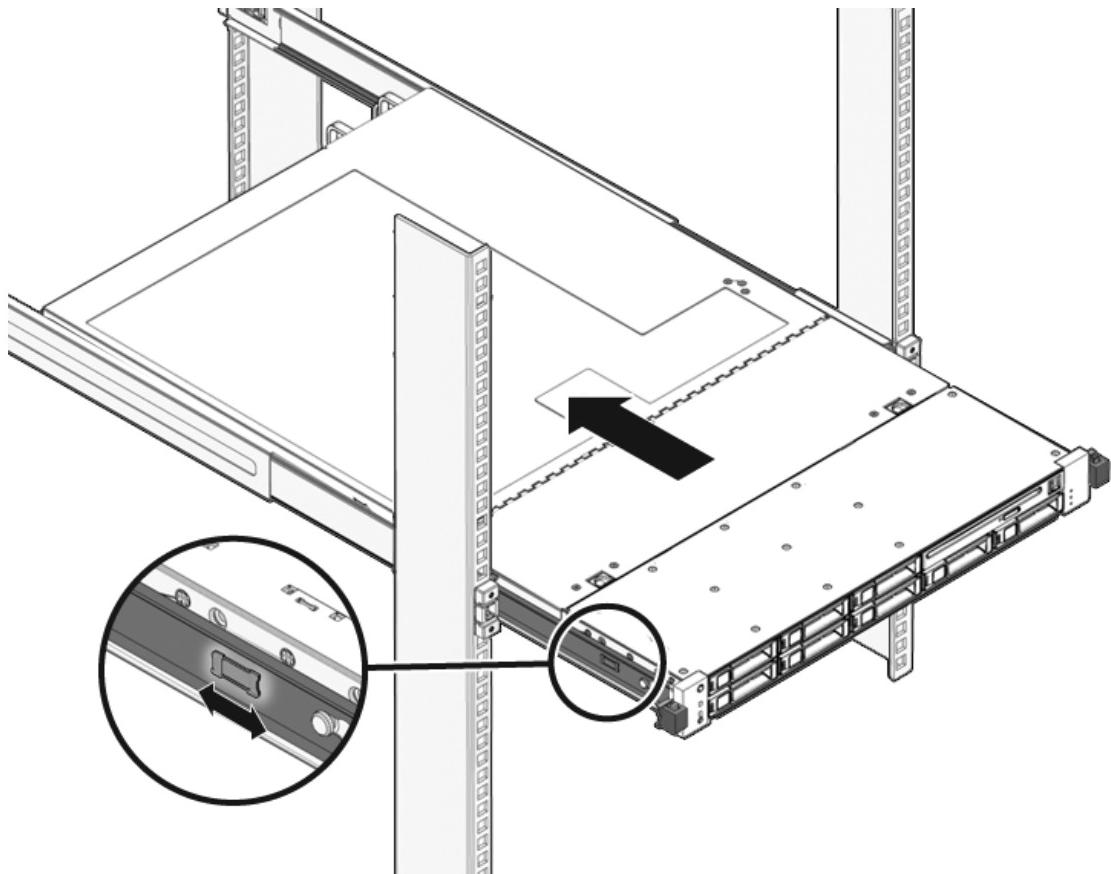


## 6.3 Returning the Server to the Normal Rack Position

If you extended the server to the maintenance position, use this procedure to return the server to the normal rack position.

- 1. Release the slide rails from the fully extended position by pushing the release tabs on the side of each rail (FIGURE 6-3).**

**FIGURE 6-3** Release Tabs on Rails



- 2. While pushing on the release tabs, slowly push the server into the rack.**  
Ensure that the cables do not get in the way.

**3. Reconnect the cables to the back of the server.**

If the CMA is in the way, disconnect the left CMA release and swing the CMA open.

**4. Reconnect the CMA.**

Swing the CMA closed and latch it to the left rack rail.

---

## 6.4

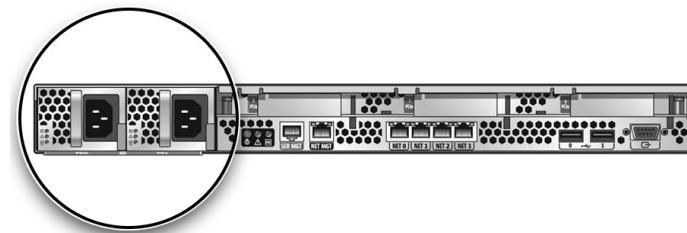
## Powering On the Server

Before powering on your server for the first time, follow the installation and cabling instructions provided in the *Sun Fire X4140 Server Installation Guide*, which is shipped with the system and is also available online.

To connect power cords and apply power to the server:

- 1. Connect the power cord (or cords) to the power supply (or supplies) on the rear panel as shown in [FIGURE 6-5](#).**

**FIGURE 6-4** Rear Panel Power Supplies



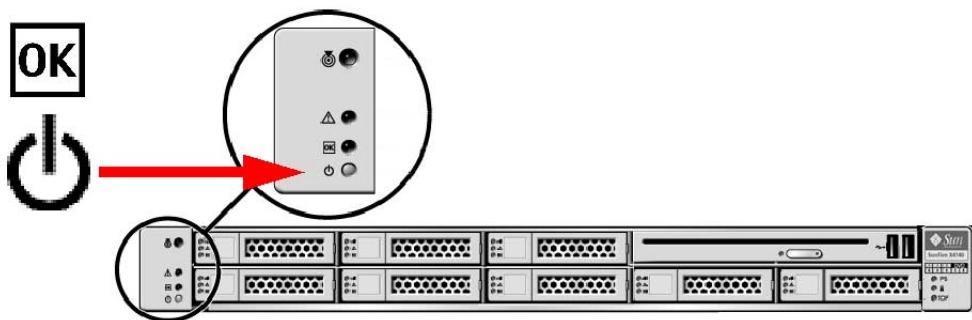
- 2. Verify that standby power is on.**

In standby power mode, the Power/OK LED on the front panel flashes.

- 3. Use a pen, or other pointed object, to press and release the recessed Power button on the server front panel.**

When the main power is applied to the server, the Power/OK LED next to the Power button lights and remains lit, as shown in [FIGURE 6-5](#).

**FIGURE 6-5** Front Panel Power/OK LED



# Connector Pinouts

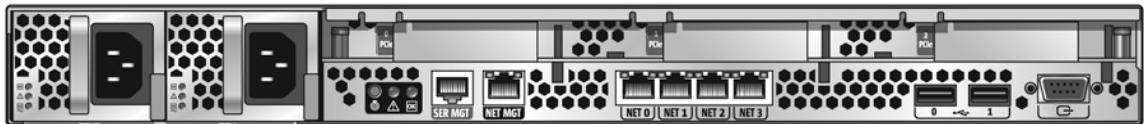
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This appendix provides reference information about the Sun Fire X4140 Server rear panel ports and pin assignments.

Topics covered in this appendix include:

- Section A.1, “Serial Management Port Connector” on page A-2
- Section A.2, “Network Management Port Connector” on page A-3
- Section A.3, “Video Connector” on page A-4
- Section A.4, “USB Connectors” on page A-5
- Section A.5, “Gigabit Ethernet Connectors” on page A-6

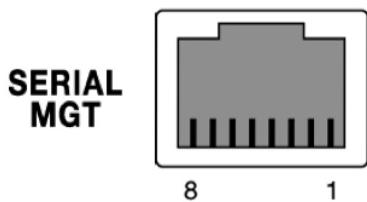
**FIGURE A-1** Sun Fire X4140 Server Rear Panel



## A.1 Serial Management Port Connector

The serial management connector (labeled SERIAL MGT) is an RJ-45 connector located on the motherboard and can be accessed from the rear panel. This port is the default connection to the system console.

**FIGURE A-2** Serial Management Connector Diagram



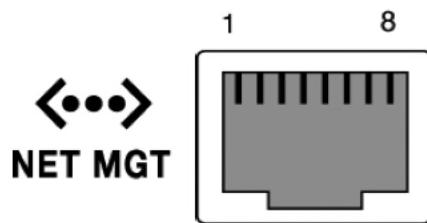
**TABLE A-1** Serial Management Connector Pins

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

## A.2 Network Management Port Connector

The network management connector (labeled NET MGT) is an RJ-45 connector located on the motherboard and can be accessed from the rear panel. This port needs to be configured prior to use.

**FIGURE A-3** Network Management Connector Diagram



**TABLE A-2** Network Management Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data -	6	Receive Data -
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

## A.3 Video Connector

The video connector (VGA) is an HD-15 connector that can be accessed from the rear panel.

**FIGURE A-4** Video Connector Diagram



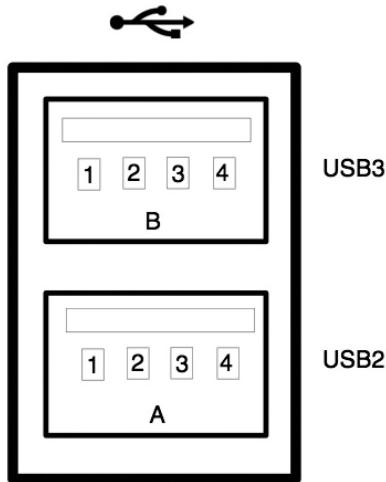
**TABLE A-3** Video Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Red Video	9	[KEY]
2	Green Video	10	Sync Ground
3	Blue Video	11	Monitor ID - Bit 1
4	Monitor ID - Bit 2	12	Monitor ID - Bit 0
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	N/C (Reserved)
8	Blue Ground		

## A.4 USB Connectors

Two Universal Serial Bus (USB) ports are located on the motherboard in a double-stacked layout and can be accessed from the rear panel.

**FIGURE A-5** USB Connector Diagram



**TABLE A-4** USB Connector Signals

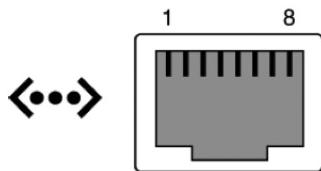
Pin	Signal Description	Pin	Signal Description
A1	+5 V (fused)	B1	+5 V (fused)
A2	USB0/1-	B2	USB2/3-
A3	USB0/1+	B3	USB2/3+
A4	Ground	B4	Ground

## A.5

# Gigabit Ethernet Connectors

Four RJ-45 Gigabit Ethernet connectors (NET0, NET1, NET2, NET3) are located on the system motherboard and can be accessed from the rear panel. The Ethernet interfaces operate at 10 Mbit/sec, 100 Mbit/sec, and 1000 Mbit/sec.

**FIGURE A-6** Gigabit Ethernet Connector Diagram



**TABLE A-5** Gigabit Ethernet Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 -
2	Transmit/Receive Data 0 -	6	Transmit/Receive Data 1 -
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 -

# BIOS Power-On Self-Test (POST) Codes

---

The system BIOS provides a basic power-on self-test (POST), during which the BIOS checks the basic devices required for the server to operate. The progress of the self-test is indicated by a series of POST codes. This chapter explains the BIOS POST testing, provides an alternate method for viewing the codes, describes how to change POST options, and lists the POST codes.

This chapter contains the following sections:

- [Section B.1, “Introduction” on page B-1](#)
  - [Section B.2, “How BIOS POST Memory Testing Works” on page B-2](#)
  - [Section B.3, “Redirecting Console Output” on page B-2](#)
  - [Section B.4, “Changing POST Options” on page B-3](#)
  - [Section B.5, “POST Codes” on page B-4](#)
- 

## B.1 Introduction

The POST is a systematic check of basic system devices. As the testing progresses, the BIOS displays codes that you can use to interpret the status of your server. The codes appear at the bottom right corner of the system’s VGA screen, after the self-test has progressed far enough to initialize the video monitor. Because the codes might scroll off of the screen too quickly to be read, an alternate method of displaying POST codes is to redirect the output of the console to a serial port (see [Section B.3, “Redirecting Console Output” on page B-2](#)).

## B.2 How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is shadowed (that is, copied from ROM to DRAM).
2. Once executing out of DRAM, the BIOS performs a simple memory test (a write/read of every location with the pattern 55aa55aa).

---

**Note** – This memory test is performed only if Quick Boot is *not* enabled from the Boot Settings Configuration screen. Enabling Quick Boot causes the BIOS to skip the memory test. See [Section B.4, “Changing POST Options” on page B-3](#) for more information.

---

3. The BIOS polls the memory controllers for both correctable and non-correctable memory errors and logs those errors into the SP.
4. The message, BMC Responding appears at the end of POST.

## B.3 Redirecting Console Output

To access the SP and redirect the console output so that the BIOS POST codes can be read remotely.

1. **Attach a multi-port dongle cable to the server module UCP connector.**
2. **Attach a monitor to the multi-port dongle cable’s video port and a keyboard to a USB connector.**
3. **Power cycle or power on the server.**  
The BIOS Main Menu screen appears.
4. **Initialize the BIOS Setup Utility by pressing the F2 key while the system is performing the power-on self-test (POST).**  
The Server screen appears.
5. **Select Server.**  
The LAN Configuration screen appears.
6. **Select AST2000 LAN Configuration.**  
The LAN Configuration screen appears.

- 7. Select the IP Address menu item.**  
The SP's IP address appears
  - 8. Start a web browser and type the SP's IP address in the browser's address bar.**
  - 9. Type a user name and password as follows:**  
User name: **root**  
Password: **changeme**
  - 10. The ILOM SP web GUI screen appears.**
  - 11. Click the Remote Control tab.**
  - 12. Click the Redirection tab.**
  - 13. Click on the Start Redirection button.**  
The javaRConsole window appears and prompts you for your user name and password again.
  - 14. When you are prompted, type a user name and password with administrator privileges.**  
The current POST screen appears.
- 

## B.4 Changing POST Options

These instructions are optional, but you can use them to change the operations that the server performs during POST testing.

To Change POST Options

- 1. Initialize the BIOS Setup Utility by pressing the F2 key while the system is performing the power-on self-test (POST).**  
The BIOS Main Menu screen appears.
- 2. Select the Boot menu.**  
The Boot Settings screen appears.
- 3. Select Boot Settings Configuration.**  
The Boot Settings Configuration screen appears.
- 4. On the Boot Settings Configuration screen, there are several options that you can enable or disable:**
  - **Hit 'F2' Message Display:** Displays "Press F2 to run Setup" in POST. This option is enabled by default.

- **Quick Boot:** This option is enabled by default. The BIOS skips certain tests while booting, such as the extensive memory test. This decreases the time it takes for the system to boot.
  - **Quiet Boot:** This option is disabled by default. If you enable this option, the Sun Microsystems logo appears instead of POST codes.
  - **Add On ROM Display Mode:** This option is set to Force BIOS by default. This option takes effect only if you have also enabled the Quiet Boot option, but it controls whether output from the Option ROM is displayed. The two settings for this option are as follows:
    - **Force BIOS:** Remove the Sun logo and display Option ROM output.
    - **Keep Current:** Do not remove the Sun logo. The Option ROM output is not displayed.
  - **Boot Num-Lock:** This option is On by default (keyboard Num-Lock is turned on during boot). If you set this option off, the keyboard Num-Lock is not turned on during boot.
  - **Wait for F1 if Error:** This option is enabled by default. The system pauses if an error is found during POST and only resumes when you press the F1 key.
  - **Interrupt 19 Capture:** This option is reserved for future use. Do not change.
- 

## B.5 POST Codes

For more information on POST codes, POST checkpoints, and POST error codes, see *Sun Fire™ X4140, X4240, and X4440 Servers Diagnostics Guide*.

# BIOS Screens

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## C.1 Configuring BIOS Settings

This section describes how to view and/or modify the BIOS Setup Utility screens in the Sun Fire X4140 Server. The BIOS Setup utility reports system information and can be used to configure the server BIOS settings.

The Basic Input/Output System (BIOS) has a Setup utility stored in the BIOS flash memory. The configured data is provided with context-sensitive Help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the BIOS settings default to the original state specified at the factory.

### C.1.1 Using BIOS Menu Items

You can access BIOS configuration screens from the following interfaces:

- Use a USB keyboard and VGA monitor, connected directly to the server.
- Use a terminal (or terminal emulator connected to a computer) through the serial port on the rear panel of the server.

To access BIOS configuration screens and change the system's parameters:

1. **Enter the BIOS Setup utility by pressing the F2 key while the system is performing the power-on self-test (POST).**

When BIOS is started, the main BIOS Setup menu screen is displayed.

---

**Note –** Refer to the *Sun Fire X4140, X4240, and X4440 Servers Diagnostics Guide* for more information about POST messages and System Event Log (SEL) messages.

---

**2. Highlight the field to be modified using the arrow and Tab keys.**

Use the left and right arrow keys to move sequentially back and forth through the menu screens. Fields that can be reconfigured are displayed in color. All other fields are nonconfigurable.

- Use the up and down arrows, on the keyboard, to scroll through a menu.
- Use the Tab key to move back and forth across columns.

**3. Press Enter to select the field.**

A dialog box shows the available options.

**4. Modify the setup field and close the screen.**

**5. If you need to modify other setup parameters, use the arrow and Tab keys to navigate to the desired screen and menu item, and then repeat Step 1 through Step 4. Otherwise, go to Step 6.**

**6. Press and release the right arrow key until the Exit menu screen appears.**

**7. Follow the instructions on the Exit menu screen to save your changes and exit the Setup utility.**

## C.1.2 BIOS Setup Screens Overview

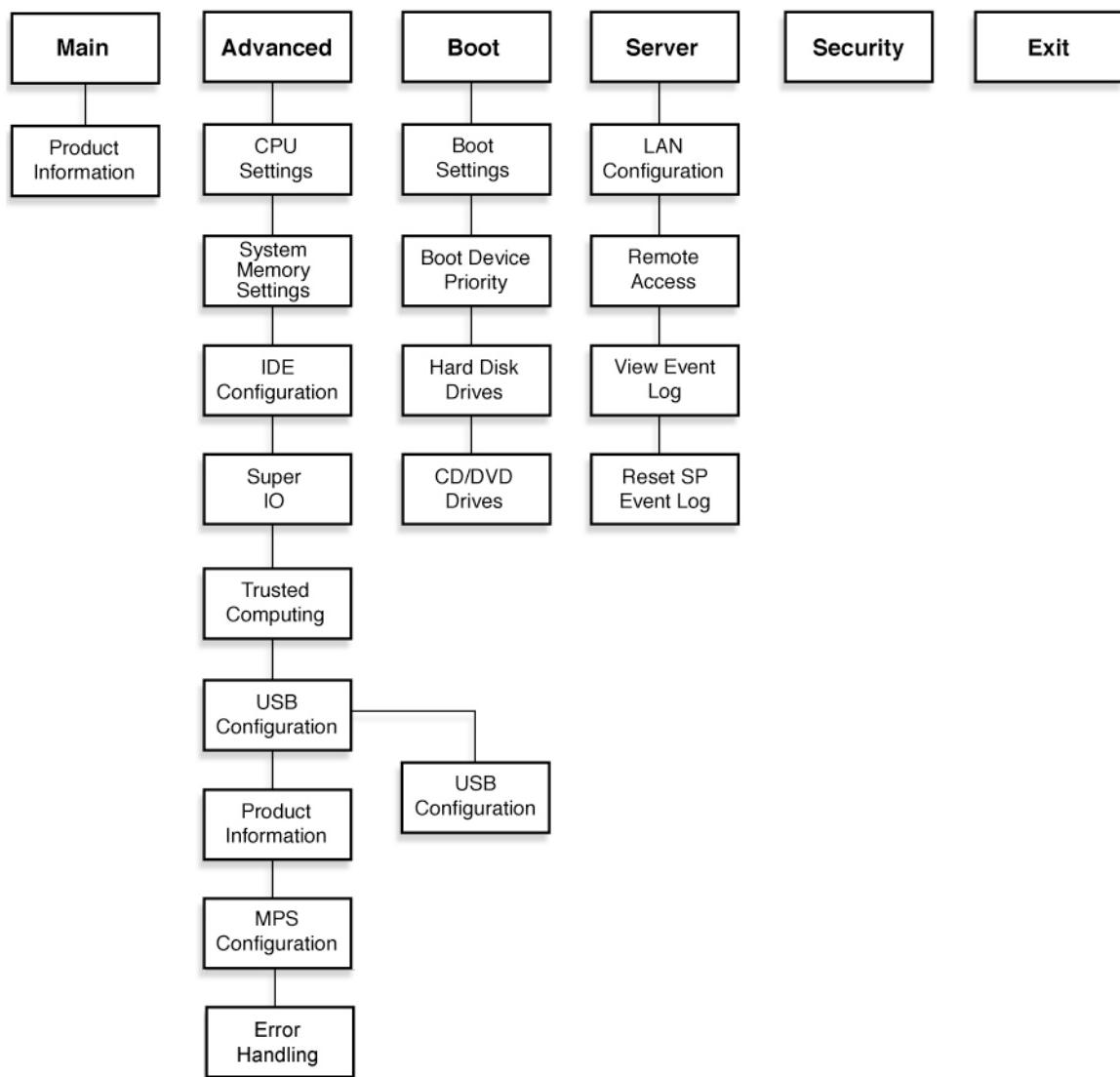
**TABLE C-1** contains summary descriptions of the top-level BIOS setup screens.

**TABLE C-1** BIOS Setup Screens Summary

Screen	Description	See...
Main	General product information, including BIOS type, processor, memory, and time/date.	<a href="#">Section C.2.1, “BIOS Main Menu Screens” on page C-5</a>
Advanced	Configuration information for the processor, memory, IDE, USB, PCI, MPS and other information.	<a href="#">Section C.2.2, “BIOS Advanced Menu Screens” on page C-6</a>
PCI/PnP	Configuration information for PCI/PnP and other information.	<a href="#">Section C.2.3, “BIOS PCI/PnP Menu Screens” on page C-19</a>
Boot	Configure the boot device priority (hard disk drives and the DVD-ROM drive).	<a href="#">Section C.2.4, “BIOS Boot Menu Screens” on page C-20</a>
Chipset	Chipset devices can be configured by the BIOS (if applicable).	<a href="#">Section C.2.6, “BIOS Chipset Menu Screens” on page C-24</a>
Security	Set or change the user and supervisor passwords.	<a href="#">Section C.2.5, “BIOS Security Menu Screens” on page C-23</a>
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or failsafe defaults.	<a href="#">Section C.2.7, “BIOS Exit Menu Screens” on page C-29</a>

**FIGURE C-1** summarizes the BIOS menu tree. See [Section C.2, “BIOS Setup Menu Screens” on page C-5](#) for examples of each of these screens.

**FIGURE C-1** BIOS Utility Menu Tree



## C.2 BIOS Setup Menu Screens

The following figures show sample Sun Fire X4140 Server BIOS Setup Utility screens.

**Note** – The screens shown are examples. The version numbers and the screen items and selections shown are subject to change over the life of the product.

All settings are set to the optimal default at startup.

### C.2.1 BIOS Main Menu Screens

The BIOS Main screens provide general product information, including BIOS type, Processor type, memory, and time/date.

The Sun Fire X4140 Server has the following BIOS Main screens:

**FIGURE C-2** BIOS Setup Utility: Main - System Overview



## C.2.2 BIOS Advanced Menu Screens

The BIOS Advanced screens provide detailed configuration information for the CPU (processor), IDE, Hyper transport, Event Log (SEL), ACPI, LOM, MPS, PCI, USB, Remote Access, and other system information.

---

**Note** – The term BMC that may be displayed on some screens refers to the SP (service processor).

---

**Note** – Refer to the *Sun Fire X4140, X4240, and X4440 Servers Diagnostics Guide* for more information about POST (Power On Self Test) messages and System Event Log (SEL) messages.

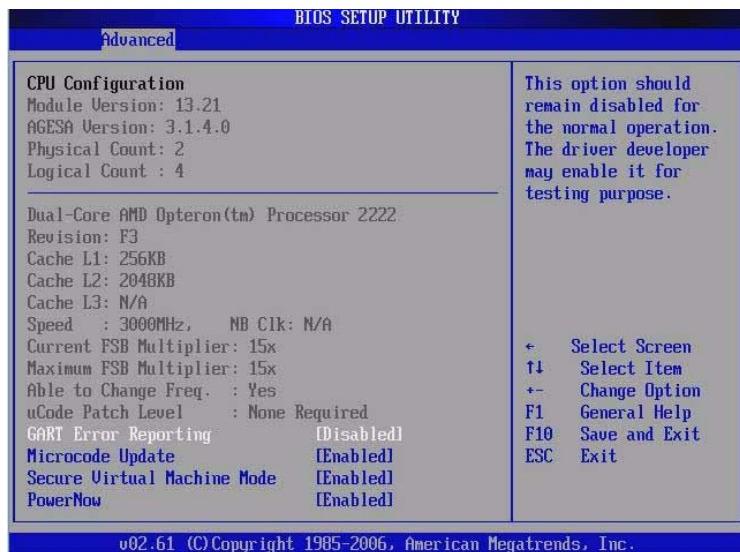
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The Sun Fire X4140 Server has the following BIOS Advanced screens:

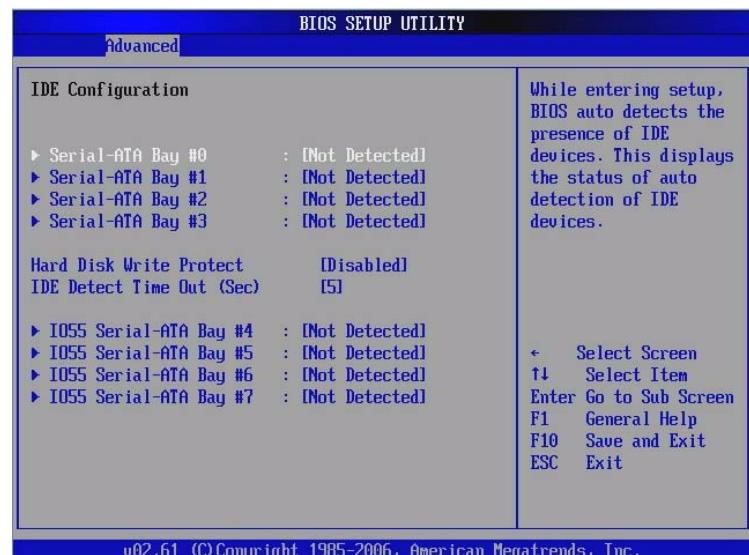
**FIGURE C-3** BIOS Setup Utility: Advanced



**FIGURE C-4** BIOS Setup Utility: Advanced- CPU Configuration



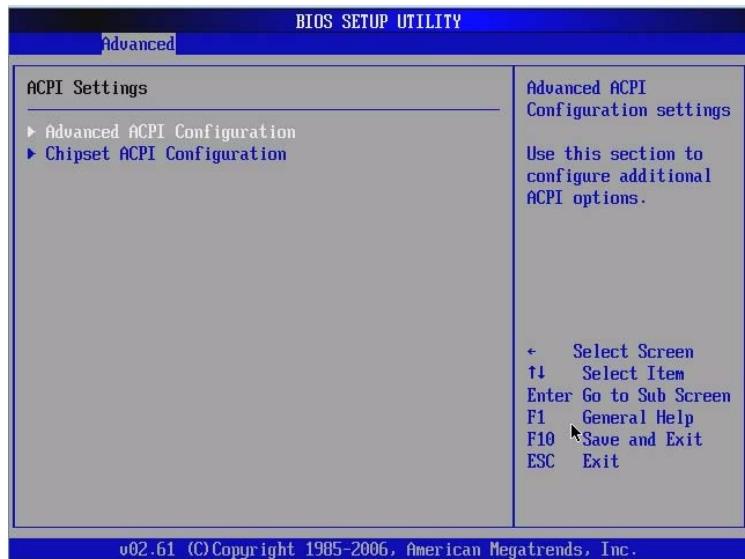
**FIGURE C-5** BIOS Setup Utility: Advanced- IDE Configuration



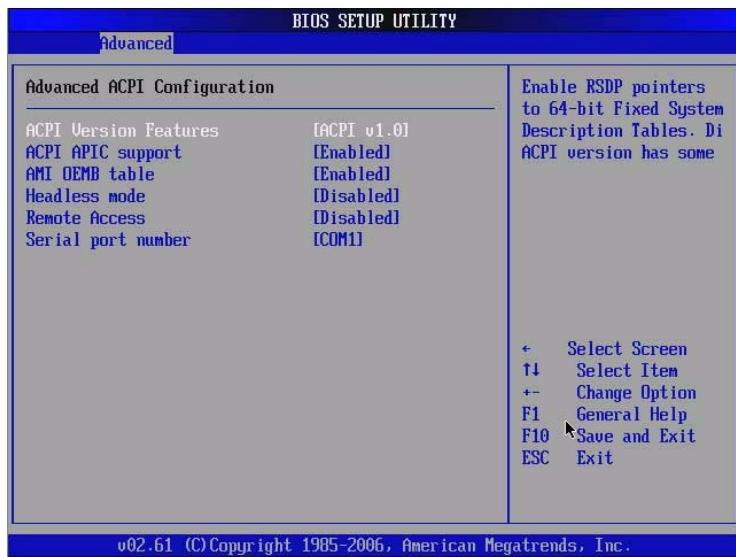
**FIGURE C-6** BIOS Setup Utility: Advanced- Hyper Transport Configuration



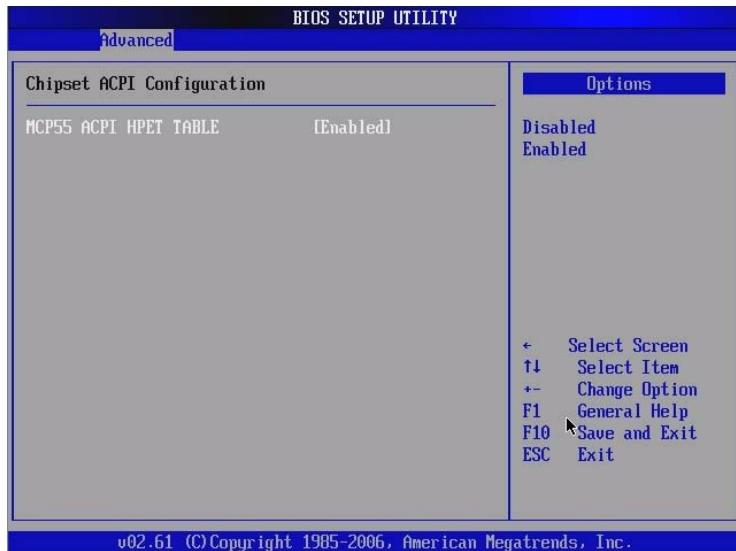
**FIGURE C-7** BIOS Setup Utility: Advanced- ACPI Settings



**FIGURE C-8** BIOS Setup Utility: Advanced- ACPI Configuration - Advanced ACPI Configuration



**FIGURE C-9** BIOS Setup Utility: Advanced- ACPI Configuration - Chipset ACPI Configuration



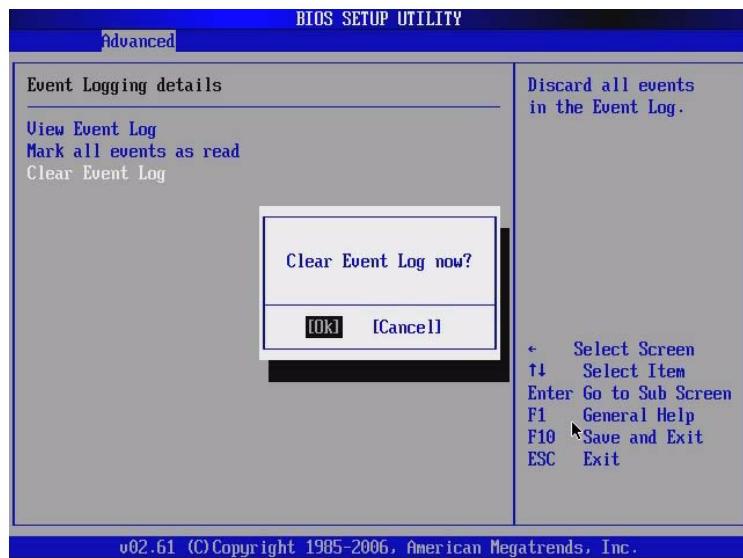
**FIGURE C-10** BIOS Setup Utility: Advanced- Event Logging Details - View



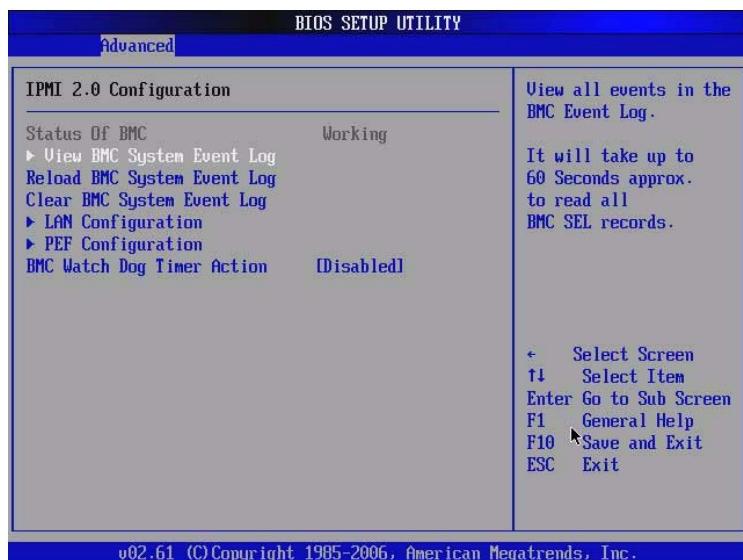
**FIGURE C-11** BIOS Setup Utility: Advanced- Event Logging Details - Mark



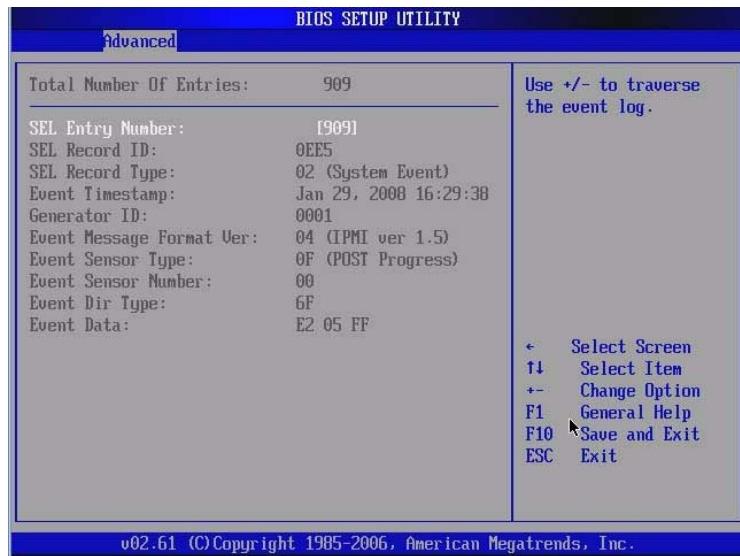
**FIGURE C-12** BIOS Setup Utility: Advanced- Event Logging Details - Clear



**FIGURE C-13** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration



**FIGURE C-14** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - System Event Logs (SEL)



**FIGURE C-15** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - Reload SEL



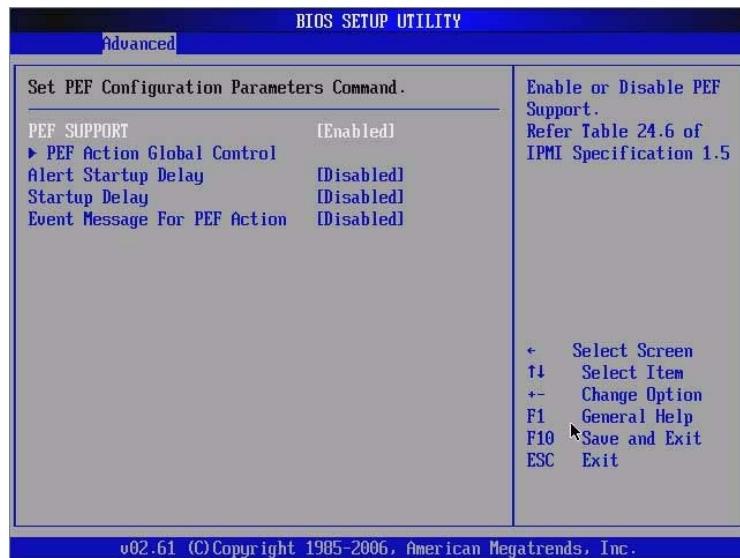
**FIGURE C-16** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - Clear BMC SEL



**FIGURE C-17** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - LAN Configuration



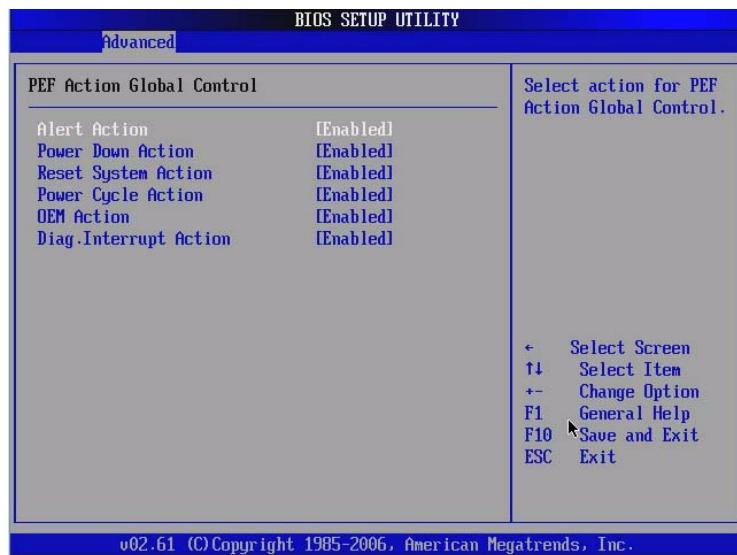
**FIGURE C-18** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - Set PEF Configuration



**FIGURE C-19** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - Set PEF Configuration Parameters



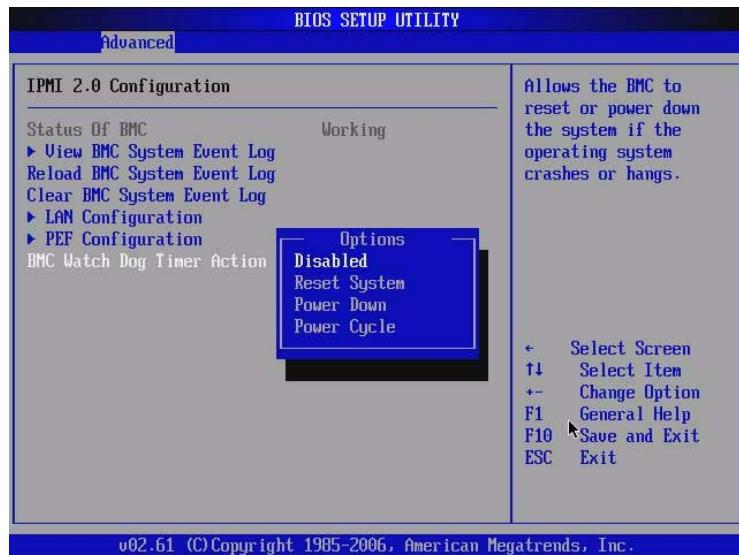
**FIGURE C-20** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - PEF Action Global Control



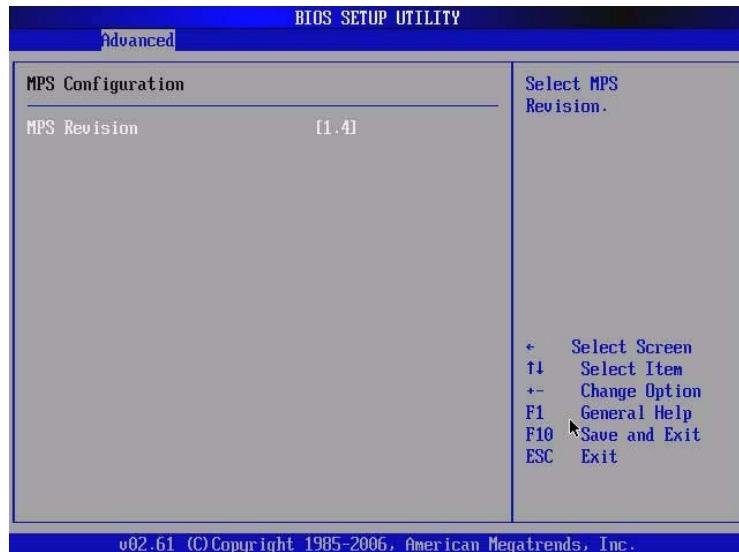
**FIGURE C-21** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - PEF Event Message



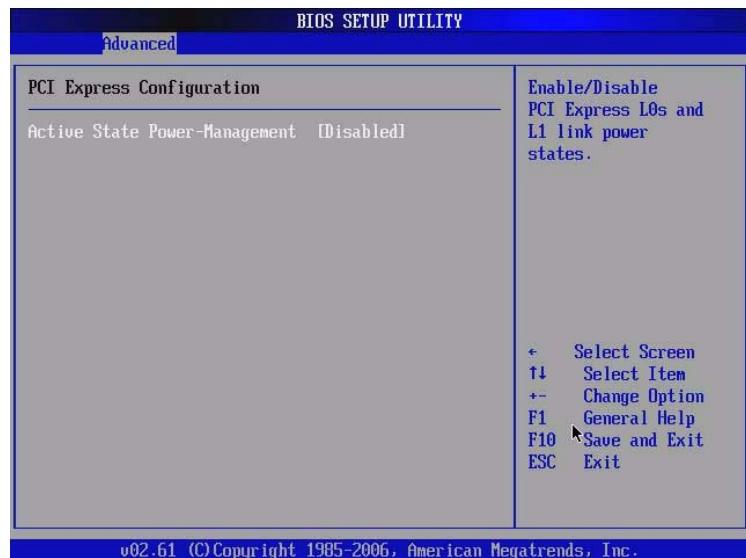
**FIGURE C-22** BIOS Setup Utility: Advanced- IPMI 2.0 Configuration - BMC Watch Dog Timer Action



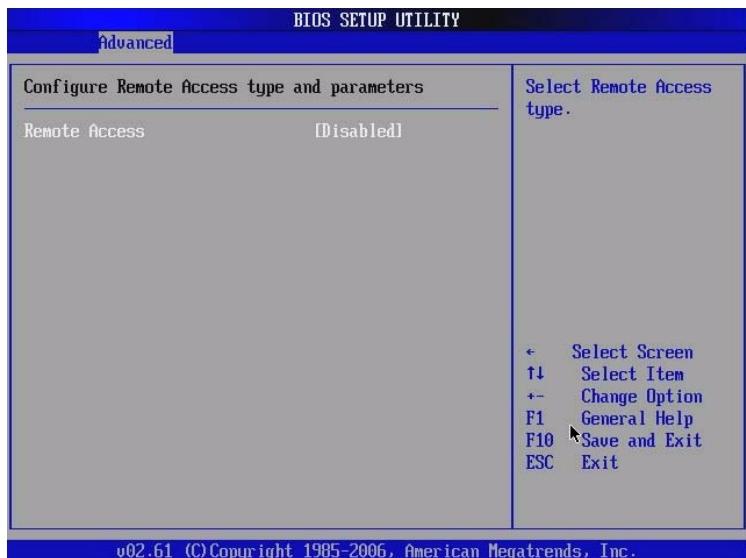
**FIGURE C-23** BIOS Setup Utility: Advanced- MPS Revision



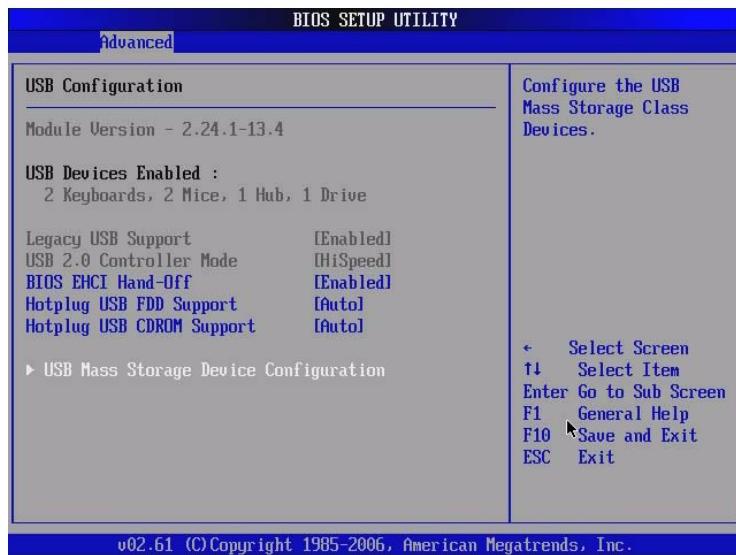
**FIGURE C-24** BIOS Setup Utility: Advanced- PCI Express Configuration



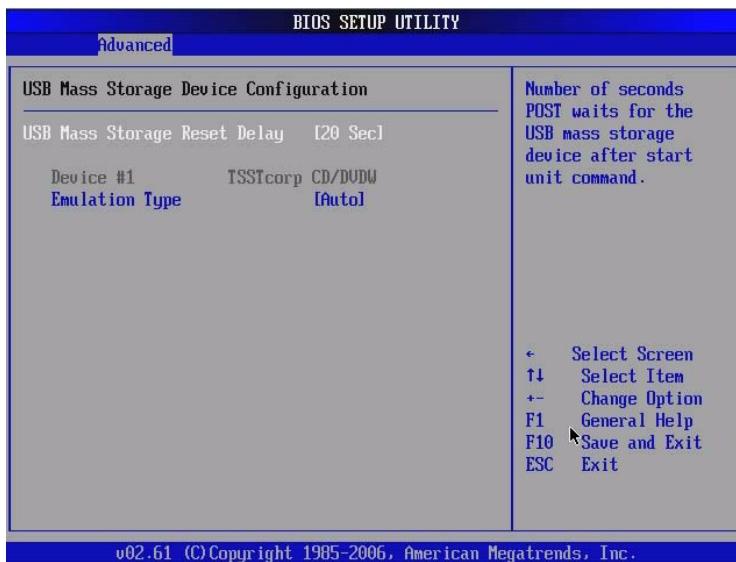
**FIGURE C-25** BIOS Setup Utility: Advanced- Remote Access Configuration



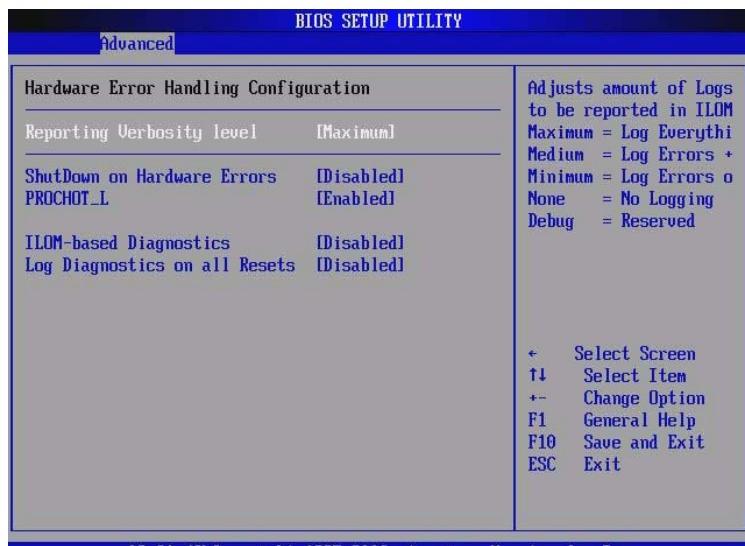
**FIGURE C-26** BIOS Setup Utility: Advanced- USB Configuration



**FIGURE C-27** BIOS Setup Utility: Advanced- USB Mass Storage Device Configuration -



**FIGURE C-28** BIOS Setup Utility: Advanced- Error Handling



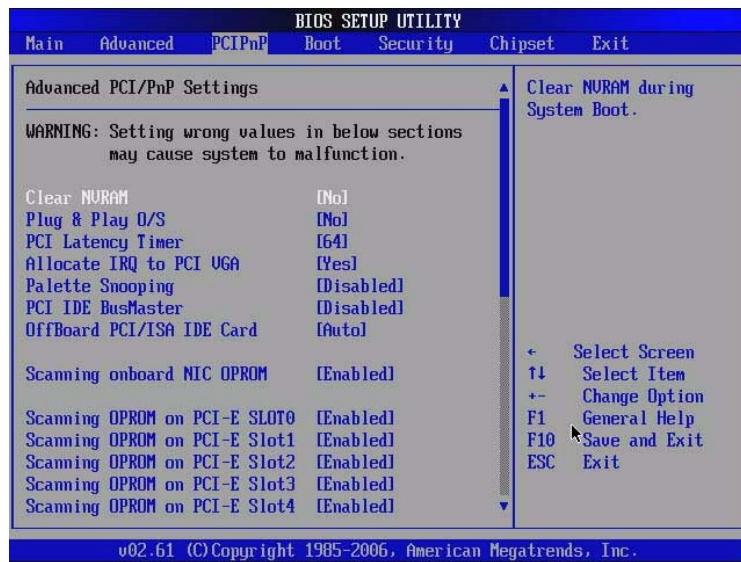
**Caution –** Hardware Error Handling features hardware-specific diagnostics and adjustments which can be used for detecting inconsistent and faulty hardware. Activating these features on a healthy system can result in an unstable execution, and are strictly for trained service personnel's use.

### C.2.3 BIOS PCI/PnP Menu Screens

The BIOS PCI/PnP screens allow you to set the PCI/PnP Configuration.

The Sun Fire X4140 Server has the following BIOS PCI/PnP screens:

**FIGURE C-29** BIOS Setup Utility: Advanced- PCI/PnP Configuration

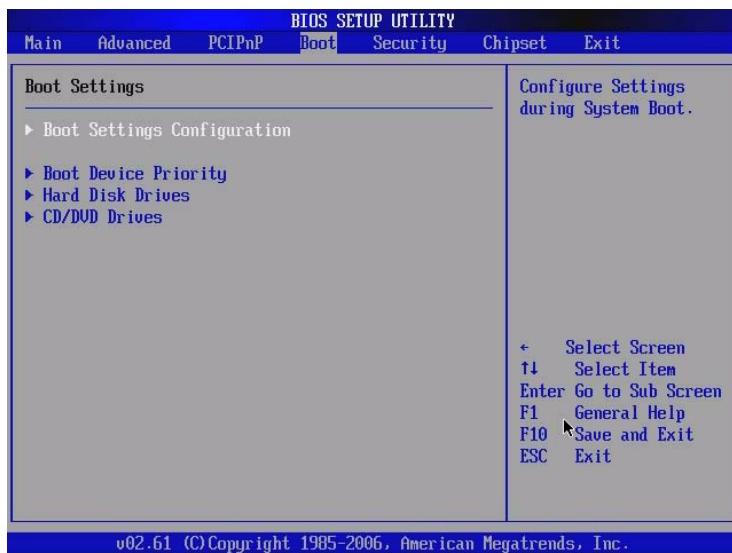


## C.2.4 BIOS Boot Menu Screens

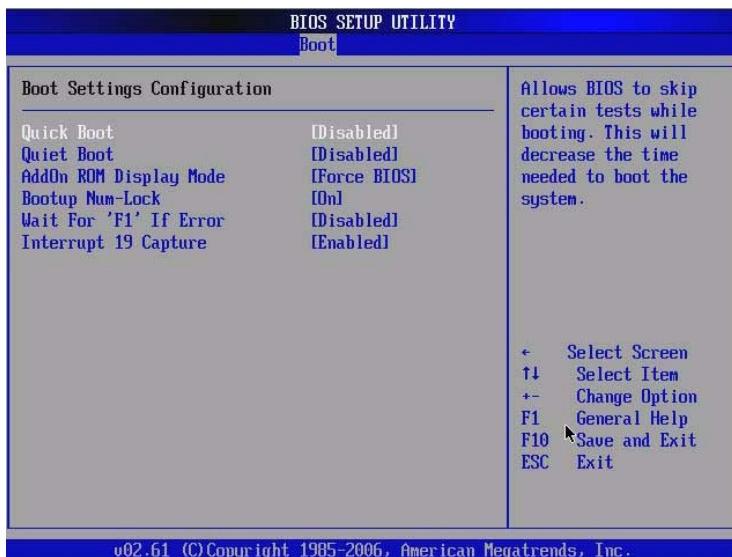
The BIOS Boot screens allow you to configure the boot device priority (hard disk drives and the DVD-ROM drive).

The Sun Fire X4140 Server has the following BIOS Boot screens:

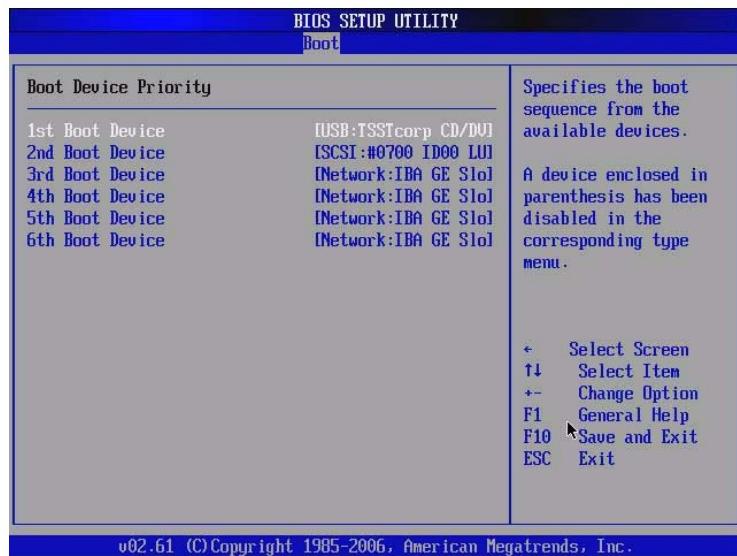
**FIGURE C-30** BIOS Setup Utility: Boot



**FIGURE C-31** BIOS Setup Utility: Boot Settings Configuration



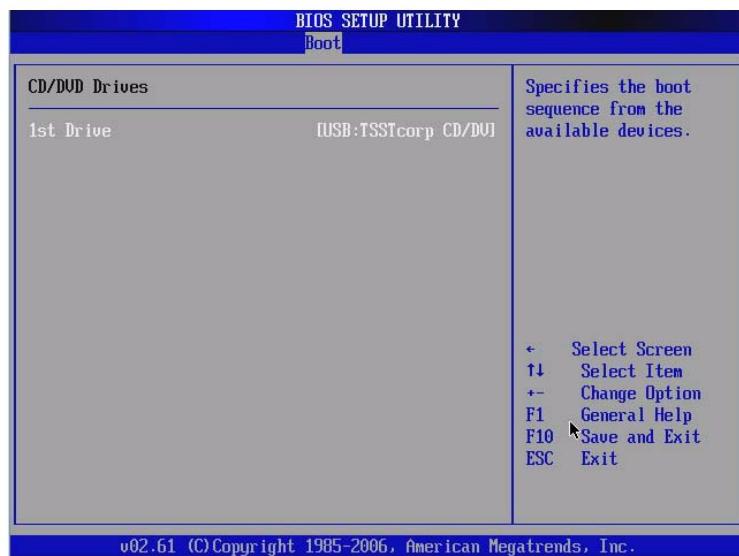
**FIGURE C-32** BIOS Setup Utility: Boot Device Priority



**FIGURE C-33** BIOS Setup Utility: Boot Hard Disk Drives



**FIGURE C-34** BIOS Setup Utility: Boot CD/DVD Drives

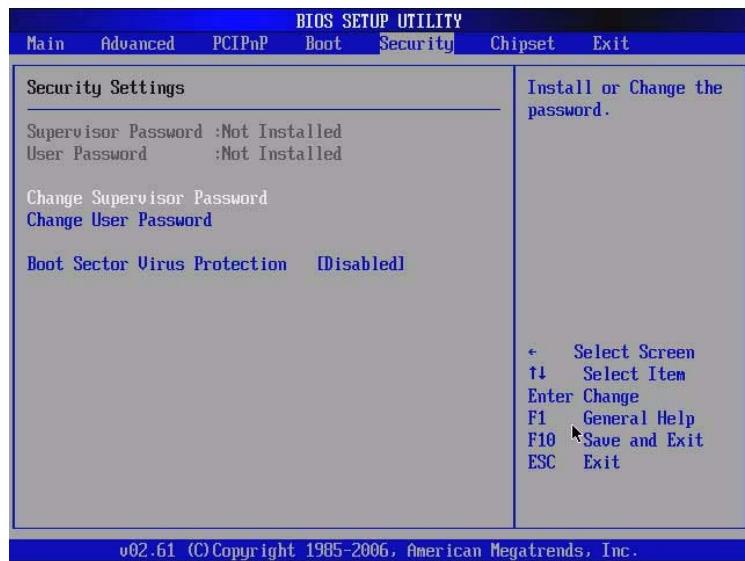


## C.2.5 BIOS Security Menu Screens

The BIOS Security screens allow you to set or change the user and supervisor passwords.

The Sun Fire X4140 Server has the following BIOS Security screens:

**FIGURE C-35** BIOS Setup Utility: Security - Change Supervisor Password

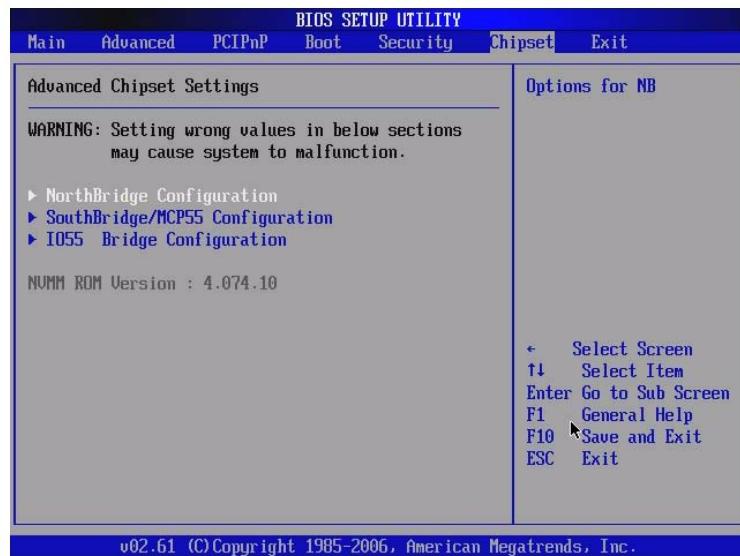


## C.2.6 BIOS Chipset Menu Screens

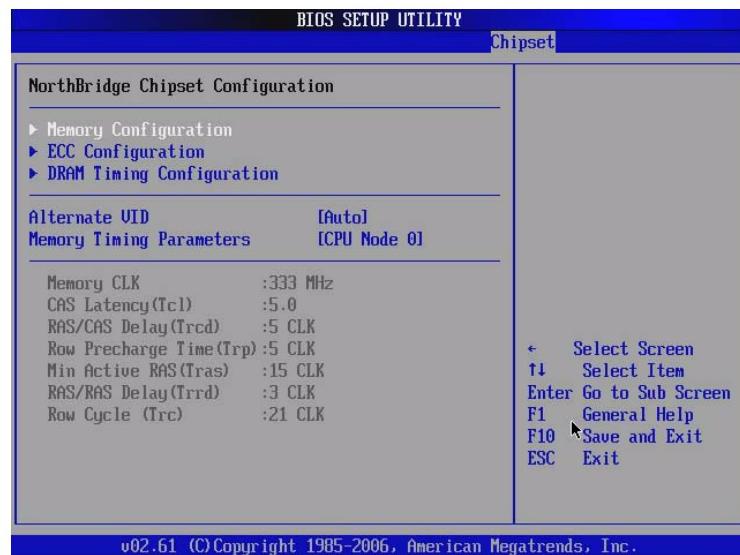
The BIOS Server screens allow you to configure Server advanced chipset settings (if applicable).

The Sun Fire X4140 Server has the following BIOS Chipset screens:

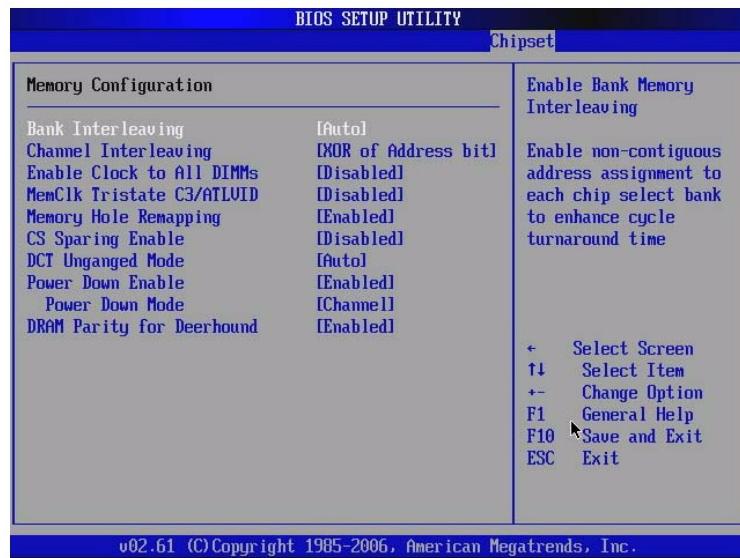
**FIGURE C-36** BIOS Setup Utility: Chipset



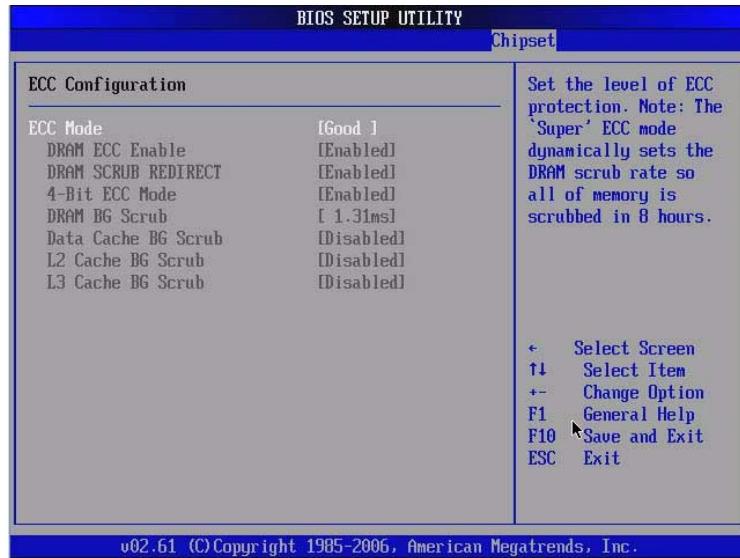
**FIGURE C-37** BIOS Setup Utility: Chipset - Northbridge Configuration



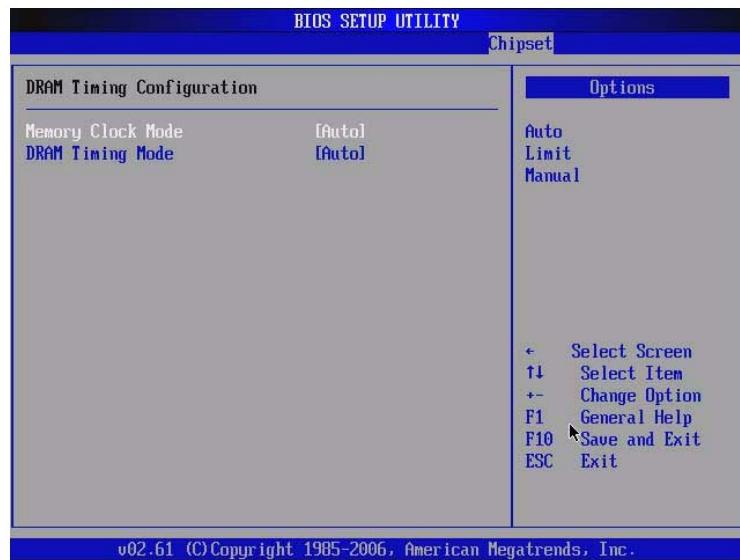
**FIGURE C-38** BIOS Setup Utility: Chipset - Northbridge Memory Configuration



**FIGURE C-39** BIOS Setup Utility: Chipset - Northbridge ECC Configuration



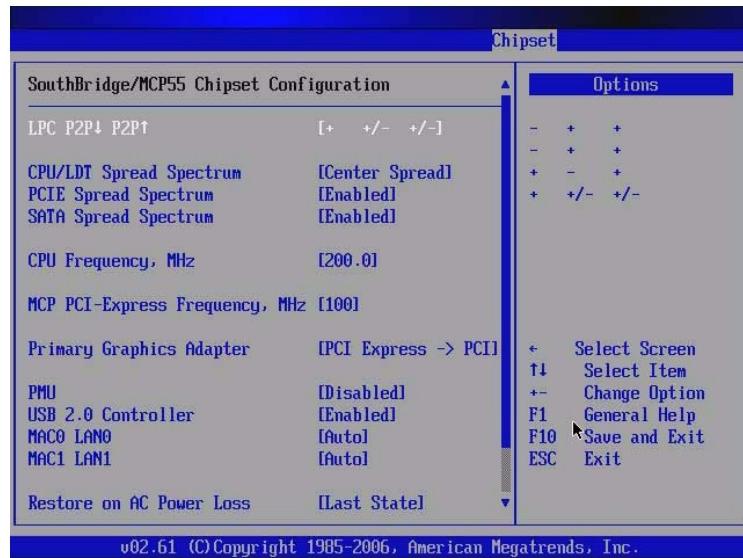
**FIGURE C-40** BIOS Setup Utility: Chipset - Northbridge DRAM Timing Configuration



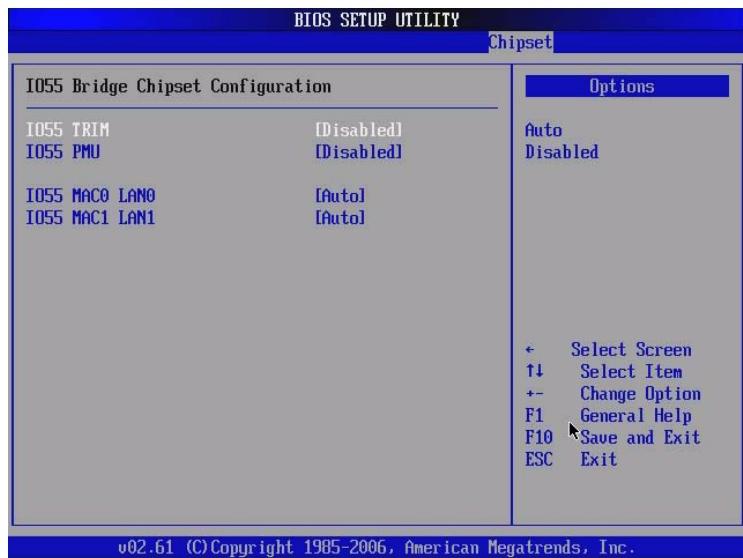
**FIGURE C-41** BIOS Setup Utility: Chipset - Northbridge VID Configuration



**FIGURE C-42** BIOS Setup Utility: Chipset - Southbridge Configuration



**FIGURE C-43** BIOS Setup Utility: Chipset - I055 Bridge Configuration

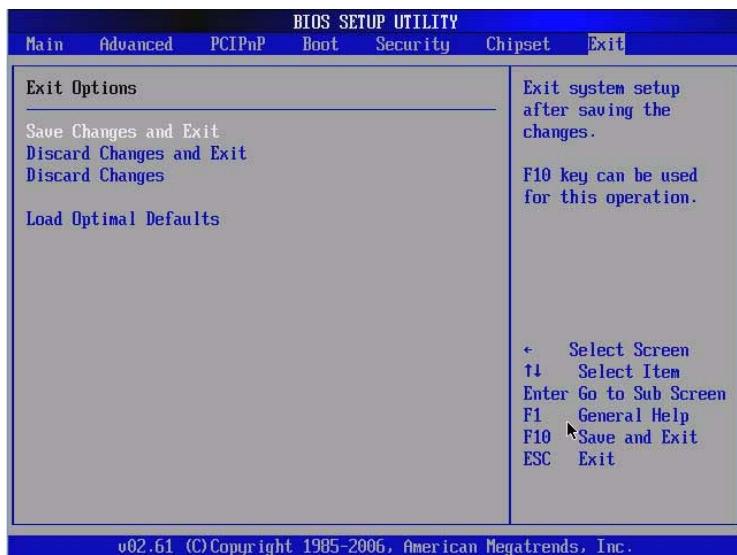


## C.2.7 BIOS Exit Menu Screens

The BIOS Exit screens allow you to save changes and exit, discard changes and exit, discard changes, or load optimal or failsafe defaults.

The Sun Fire X4140 Server has the following BIOS Exit screens:

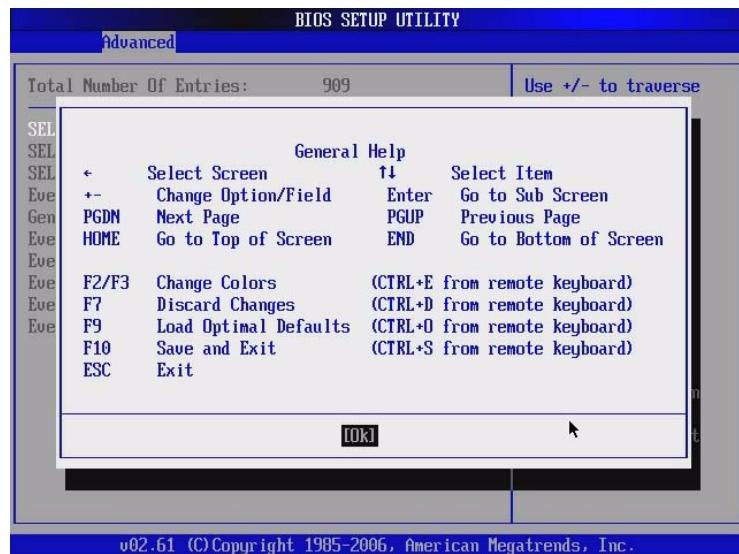
**FIGURE C-44** BIOS Setup Utility: Exit



**FIGURE C-45** BIOS Setup Utility: Exit - Save Configuration Changes



**FIGURE C-46** BIOS Setup Utility: Help



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